TECO

TAMPA ELECTRIC

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MAY 03 2002

BUREAU OF AIR REGULATION

April 30, 2002

Mr. Lynn Haynes
Region IV
U.S. Environmental Protection Agency
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-3104

Via FedEx
Airbill No. 7920 2537 6783

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, FL 33619

Via FedEx
Airbill No. 7920 2540 1641

Re: Tampa Electric Company (TEC)
Polk Power Station Unit 3
Part 75 Commercial Operation Re-Notifications
FDEP File No. PSD-FL-263

Dear Messrs. Haynes and Proses:

As required by 40 CFR 75.61(a)(2)(i) and Condition 1 of permit PSD-FL-263, the designated representative for an affected unit shall submit written notification for the planned date when a new unit will commence commercial operation. TEC notified the agency of a commence commercial operation date of May 1, 2002. As required by 40 CFR 75.61(a)(2)(ii) and Condition 1 of permit PSD-FL-263, if the date when the unit commences commercial operation changes from the planned date, a notification of the actual date shall be submitted not later than 7 days following the date the unit commences commercial operation. *TEC hereby gives notice that Polk Power Station Unit 3 commenced commercial operation on April 24, 2002.*

If there are any other changes in regard to these dates, TEC will continue to notify the agency. If you have any questions or comments, please contact me at (813) 641-5261.

Sincerely,

Laura R. Crouch

Laura R. Crouch
Manager – Air Programs
Environmental Affairs

EA/bmr/RC121

c: Mr. J. Kahn - FDEP
Mr. J. Kissel – FDEP SW
Mr. A. Linero – FDEP
Kim Nguyen - CAMD
Mr. H. Oven – FDEP
Mr. S. Sheplak – FDEP

TAMPA ELECTRIC

March 21, 2002

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MAR 27 2002
BUREAU OF AIR REGULATION

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, FL 33619

Via FedEx
Airbill No. 7903 5139 0036

Re: Tampa Electric Company (TEC)
Polk Power Station Unit 3
Commercial Operation PSD Notification
FDEP File No. PSD-FL-263

Dear Mr. Proses:

As required by 40 CFR 75.61(a)(2)(i) and Condition 1 of permit PSD-FL-263, the designated representative for an affected unit shall submit written notification: For a new unit or a newly affected unit, of the planned date when a new unit or newly affected unit will commence commercial operation or, for new stack or flue gas desulfurization system, of the planned date when a new stack or flue gas desulfurization system will be completed and emissions will first exit to the atmosphere. Notification of the planned date shall be submitted not later than 45 days prior to the date the unit commences commercial operation, or not later than 45 days prior to the date when a new stack or flue gas desulfurization system exhausts emissions to the atmosphere. TEC hereby gives notice that commercial operation of Polk Power Station Unit 3 will be on May 10, 2002.

If you have any questions, please feel free to call me at (813) 641-5261.

Sincerely,

Raiza Calderon

Raiza Calderon
Engineer
Environmental Affairs

EA/bmr/RC111

c: Mr. A. Linero – FDEP
Mr. H. Oven – FDEP
Mr. S. Sheplak – FDEP
Mr. J. Kissel – FDEP SW

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OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

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APR 01 2002

BUREAU OF AIR REGULATION

March 25, 2002

Mr. Lynn Haynes
Region IV
U.S. Environmental Protection Agency
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-3104

Via FedEx
Airbill No. 7903 5561 0396

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, FL 33619

Via FedEx
Airbill No. 7903 5560 3729

Re: Tampa Electric Company (TEC)
Polk Power Station Unit 3
Part 60 & 75 Notifications and Re-Notifications
FDEP File No. PSD-FL-263

Dear Messrs. Haynes and Proses:

As required by 40 CFR 60.7 and Condition 3 of permit PSD-FL-263, the designated representative for an affected unit shall submit written notification for the anticipated date of initial startup. TEC notified the agency of an initial start up date of April 7, 2002. Since then, this date has been rescheduled for April 4, 2002.

As required by 40 CFR Part 60.8(a) and Condition 3 of permit PSD-Fl-263, within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility, the owner or operator of such facility shall conduct performance test(s) and furnish the Administrator a written report of the results of such performance test(s). Also as required by 40 CFR Part 60.8(d) and Condition 3 of permit PSD-FL-263, the owner or operator of an affected facility shall provide the Administrator at least 30 days prior notice of any performance test. TEC hereby gives notice that the initial performance test for Polk Unit 3 will begin on May 6, 2002.

As required by 40 CFR 75.61(a)(2)(i) and Condition 1 of permit PSD-FL-263, the designated representative for an affected unit shall submit written notification for the planned date when a new unit will commence commercial operation. TEC notified the agency of a commence commercial operation date of May 10, 2002. Since then, this date has been rescheduled for May 1, 2002.

As required by 40 CFR Part 75.61(a)(1)(i) and Condition 1 of permit PSD-FL-263, initial certification test notifications shall be submitted not later than 45 days prior to the first scheduled day of initial certification testing. TEC notified the agency of an initial CEMS performance testing date of May 1, 2002 through the Acid Rain Program CEMS Monitoring plan. Since then, this date has been rescheduled to perform the cycle response time, linearity test, and seven day drift on April 10, 2002 and the stack stratification and stack RATA on May 6, 2002.

If there are any other changes in regard to these dates, TEC will continue to notify the agency. If you have any questions or comments, please contact me at (813) 641-5261.

Sincerely,

Raiza Calderon
Engineer
Environmental Affairs

EA/bmr/RC113

c: Mr. J. Kahn - FDEP
Mr. J. Kissel – FDEP SW
Mr. A. Linero – FDEP
Kim Nguyen - CAMD
Mr. H. Oven – FDEP
Mr. S. Sheplak – FDEP

TAMPA ELECTRIC

RECEIVED
APR 10 2002
BUREAU OF AIR REGULATION

April 5, 2002

Mr. Lynn Haynes
U.S. Environmental Protection Agency
Region IV
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-3104

Via FedEx
Airbill No. 7918 1023 5327

Mr. Bill Proses
Florida Department of
Environmental Protection
3804 Coconut Palm Drive
Tampa, FL 33619

Via FedEx
Airbill No. 7920 1266 2822

Re: Tampa Electric Company (TEC)
Polk Power Station Unit 3
Part 75 Re-Notifications
FDEP File No. PSD-FL-263

Dear Messrs. Haynes and Proses:

As required by 40 CFR Part 75.61(a)(1)(i) and Condition 1 of Permit PSD-FL-263, initial certification test notifications shall be submitted not later than 45 days prior to the first scheduled day of initial certification testing. TEC notified the agency on March 25, 2002 of an initial CEMS performance testing to perform the cycle response time, linearity test, and seven day drift on April 10, 2002 and the stack stratification and stack RATA on May 6, 2002. Since then, the cycle response time, linearity test, and seven day drift were reschedule for April 8, 2002 and re-notified. *There has been another change and these tests have been rescheduled again for April 6, 2002. The stack stratification and stack RATA remain on schedule for May 6, 2002.*

If there are any other changes regarding these dates, TEC will continue to notify the agency. If you have any questions or comments, please contact me at (813) 641-5261.

Sincerely,

Raiza Calderon

Raiza Calderon
Engineer
Environmental Affairs

EA/gm/RC118

c: Mr. J. Kahn - FDEP
Mr. J. Kissel – FDEP SW
Mr. A. Linero – FDEP
Kim Nguyen - CAMD
Mr. H. Oven – FDEP
Mr. S. Sheplak – FDEP

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APR 08 2002

BUREAU OF AIR REGULATION

April 2, 2002

Mr. Lynn Haynes
U.S. Environmental Protection Agency
Region IV
Atlanta Federal Center
61 Forsyth Street
Atlanta, Georgia 30303-3104

Via FedEx
Airbill No. 7920 1060 2180

Mr. Bill Proses
Florida Department of
Environmental Protection
3804 Coconut Palm Drive
Tampa, FL 33619

Via FedEx
Airbill No. 7920 1060 4297

Re: Tampa Electric Company (TEC)
Polk Power Station Unit 3
Part 60 & 75 Re-Notifications
FDEP File No. PSD-FL-263

Dear Messrs. Haynes and Proses:

As required by 40 CFR 60.7 and Condition 3 of permit PSD-FL-263, the designated representative for an affected unit shall submit written notification for the anticipated date of initial startup. TEC re-notified the agency on March 25 2002 of an initial start up date of April 4, 2002. Since then, this date has been rescheduled for April 6, 2002.

As required by 40 CFR Part 75.61(a)(1)(i) and Condition 1 of permit PSD-FL-263, initial certification test notifications shall be submitted not later than 45 days prior to the first scheduled day of initial certification testing. TEC notified the agency on March 25, 2002 of an initial CEMS performance testing to perform the cycle response time, linearity test, and seven day drift on April 10, 2002 and the stack stratification and stack RATA on May 6, 2002. Since then, the cycle response time, linearity test, and seven day drift have been reschedule for April 8, 2002. The stack stratification and stack RATA remain on scheduled for May 6, 2002.

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OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

If there are any other changes in regard to these dates, TEC will continue to notify the agency. If you have any questions or comments, please contact me at (813) 641-5261.

Sincerely,

Raiza Calderon
Engineer
Environmental Affairs

EA/bmr/RC116

c: Mr. J. Kahn - FDEP
Mr. J. Kissel – FDEP SW
Mr. A. Linero – FDEP
Kim Nguyen - CAMD
Mr. H. Oven – FDEP
Mr. S. Sheplak – FDEP

Best Available Copy

SENDER:

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

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. Gregory Nelson, PE
Director - Env. Planning
Tampa Electric Co.
P O Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 341 355 303

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

7. Date of Delivery
JUN 1

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

...'s your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

...urn Receipt

Z 341 355 303

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

Sent to	Gregory Nelson
Street & Number	TECO
Post Office, State, & ZIP Code	Tampa Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	Petcoke 5-30-00 Polk Power St. Unit 1

PS Form **3800**, April 1995

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Gregory M. Nelson, PE
TECO
PO Box 111
Tampa, Fl
33601-0111

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)*

B. Date of Delivery APR 13

C. Signature
X
☐ Agent
☐ Addressee

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

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

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

2. Article Number *(Copy from service label)* Z 031 391 940

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

Z 031 391 940

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

Sent to	Greg. Nelson
Street & Number	TECO
Post Office, State, & ZIP Code	Tampa Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	NOX DACT
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	Polk Power St. Unit 1 4-11-00

PS Form **3800**, April 1995

Fold at line over top of envelope

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Gregory M. Nelson, P.E.
TECO
PO Box 111
Tampa, Fl
33601-0111

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)*

B. Date of Delivery
APR 12

C. Signature
X

☐ Agent
☐ Addressee

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

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

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

2. Article Number *(Copy from service label)* Z 031 391 939

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

Z 031 391 939

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

Sent to	Gregory Nelson
Street & Number	TECO
Post Office, State, & ZIP Code	Tampa Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	Petcoke Test
Return Receipt Showing to Whom & Date Delivered	Burn Report
Return Receipt Showing to Whom, Date, & Addressee's Address	PPS Unit 1
TOTAL Postage & Fees	$
Postmark or Date	4-10-00

PS Form 3800, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Charles A Shelnut, GM
Tampa Electric Co
PO Box 775
Tampa, Fl
33680-0775

4a. Article Number
Z 031 391 902

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

7. Date of Delivery DEC 17 1999

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

PS Form **3811,** December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 031 391 902

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

Sent to Charles Shelnutt	
Street & Number TECO	
Post Office, State, & ZIP Code TAMPA Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date PSD-Fl-194 12-14-99 1050233-002-AC	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Charles Shelnut, G.M.
TECo
PO Box 775
Tampa, Fl
33680-0775

4a. Article Number
Z 031 391 999

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

7. Date of Delivery
NOV - 8 1999

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

PS Form **3811**, December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 031 391 999

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

Sent to Charles Shelnut	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 11-4-99 1050233-002-AC PSD-Fl-194(e)	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
James Hunter, Admin.
Air Program, EP
Tampa Electric Co
PO Box 111
Tampa, Fl
33601-0111

4a. Article Number
P 265 659 310

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

7. Date of Delivery
OCT - 4 1999

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

PS Form **3811,** December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 310

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

Sent to James Hunter	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 9-28-99 Syngas Comb. Turbine	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Mr. James Hunter, AEP
Tampa Electric Co.
P O Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 333 612 527

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

7. Date of Delivery
10-9-98

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 612 527

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

Sent to James Hunter	
Street & Number TECo	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Polk Power St. 10-7-98 PSD-Fl-194D	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. James Hunter
TECO
PO Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 333 612 524

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

7. Date of Delivery
10-7-98

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 612 524

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

Sent to James Hunter	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 10-5-98 1050233-002-AC P50-F1-194C	

PS Form **3800**, April 1995

Fold at line over top of envelope to

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Gregory M. Nelson, PE
Tampa Electric Co.
P O Box 111
Tampa, Fl
33601-0111

4a. Article Number
Z 333 612 519

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

7. Date of Delivery
9-28-98

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

Thank you for using Return Receipt Service.

PS Form **3811,** December 1994 102595-97-B-0179 Domestic Return Receipt

Z 333 612 519

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

Sent to Greg Nelson	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date PSD-FI-194B 9-24-98	

PS Form **3800**, April 1995

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP FILE PSD-FL-194B
Polk Power Station Integrated Gasification Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Tampa Electric Company (TEC) to extend the demonstration period for gas cleaning technology from two to three years at its Integrated Gasification Combined Cycle Facility (Polk Power Station) located at 9895 State Road 37 South Mulberry, Polk County. A Best Available Control Technology determination was not required pursuant to Rule 62-212.400, F.A.C. or 40CFR52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Tampa Electric Company, Post Office Box 111, Tampa, Florida 333601-0111.

The present permit provides for a two year period to demonstrote hot gas cleanup technology at the 260 megawatt Polk Power Station that was built with joint funding by TEC and the Department of Energy (DOE). The request will defer the hot gas cleanup demonstration until the sorbent becomes more commercially viable. TEC and DOE will focus instead on other sulfur dioxide and carbon dioxide reduction activities, thus extending the demonstration period to three years. This revised period will end on September 30, 1999. The ending date for a subsequent period to demonstrate compliance with the nitrogen oxides limit of 25 ppm while operating the facility using cold gas cleanup will be extended to April 2001. A revised BACT will be issued by the Department by June 2001.

The extra year of demonstration will permit the facility to emit sulfur dioxide and nitrogen oxides emissions at higher rates than ultimately allowed by the present permit. This amount is equal to approximately 1860 tons of nitrogen oxides and 700 tons of sulfur dioxide.

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

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Departments Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit modification and require, if applicable, another Public Notice.

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

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

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

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

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

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

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

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

B-776 - 8-7; 1998

AFFIDAVIT OF PUBLICATION
THE LEDGER
Lakeland, Polk County, Florida

Case No ....

Attach Notice Here

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared David Vail, who on oath says that he is Controller of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a

Public Notice Of Intent

in the matter of

DEP FILE PSD-FL-194B

in the

Court, was published in said newspaper in the issues of

August 7;

1998

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed David Vail
David Vail
Controller

By David Vail who is personally known to me

Sworn to and subscribed before me this 7TH

day of August A.D. 19 98

(Seal) Donald Ray Jenkins
Notary Public

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

My Commission Expires

Order#706888
TECO

B776

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Gregory N. Nelson, P.E.
Tampa Electric Co.
P O Box 111
Tampa, Fl
33601-0111

4a. Article Number
P 265 659 398

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

7. Date of Delivery 8/3/98

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 398

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

Sent to Gregory Nelson	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 7-31-98 PSD-FI-194B	

PS Form **3800**, April 19..

Fold at line over top of envelope to the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Janice Taylor
TECo
PO Box 111
Tampa, Fl 33601-0111

4a. Article Number
P 265 659 359

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

7. Date of Delivery JUN 18 1998

5. Received By: (*Print Name*) RM

6. Signature: (*Addressee or Agent*)
X RM

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

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

P 265 659 359

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

Sent to Janice Taylor	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 6-16-98 1050233-002-AC DPS PSD-FI-194A	

PS Form **3800**, April 1995

Fold at line over top of envelope to

Is your **RETURN ADDRESS** completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Gregory M. Nelson, PE
Environmental Planning
Air Program
Tampa Electric Co
P O Box 111
Tampa, Fl 33601-0111

4a. Article Number
P 265 659 319

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

7. Date of Delivery
3-30-98

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

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

Thank you for using Return Receipt Service.

P 265 659 319

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

Sent to: Gregory Nelson	
~~Street & Number~~: TECO	
~~Post Office~~, State, & ZIP Code: Tampa, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: 3-26-98 PSD-FI-194(a) PA 92-32	

PS Form **3800**, April 1995

Is your RETURN ADDRESS completed on the reverse side?

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

... to receive the following services (for an extra fee):

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

Consult postmaster for fee.

3. Article Addressed to:
G.F. Anderson
Tampa Electric Co
P O Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 311 902 951

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

7. Date of Delivery
MAR 10 1995

5. Signature (Addressee)

6. Signature (Agent)

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

Thank you for using Return Receipt Service.

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Z 311 902 951

UNITED STATES POSTAL SERVICE

Receipt for Certified Mail

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

PS Form 3800, March 1993

Sent to G. F. Anderson	
Street and No. TECO	
P.O., State and ZIP Code Tampa, 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 PSD-FI-194(A) PA-92-32	3-8-95

Best Available Copy

ENVIRONMENTAL PROTECTION COMMISSION HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
FAX (813) 272-5157

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

ENVIRONMENTAL PROTECTION COMMISSION of Hillsborough County

FAX Transmittal Sheet

DATE: Sept 22, 2000

TO: Mr. Al Linero

FAX Phone: ______ Voice Phone: ______

TOTAL NUMBER OF PAGES INCLUDING THIS COVER PAGE: ____

EPC FAX Transmission Line: (813) 272-5605
For retransmission or any FAX problems, call:
(813) 272-5530 ext. 1288

FROM: Rob Kalch

(Circle applicable section below)

Air Division

-Compliance -Enforcement/Analysis

-Monitoring/Toxics -Permitting

SPECIAL INSTRUCTIONS: ______

Best Available Copy

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
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AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

MEMORANDUM

DATE: September 22, 2000

TO: Rick Muratti
Assistant County Attorney

FROM: Rob Kalch **THRU:** Jerry R. Campbell, Director
EPC, Air Division

SUBJECT: **TECO Polk Power Station Modifications**

On August 14, 2000, EPC staff received a copy of the DEP Notice of Intent to Issue Proposed Modification of Power Plant Certification. Polk Power Station is a power generating facility located approximately 35 miles Southeast of Tampa. The facility's allowable emissions are listed below as they appear on the FDEP website:

Pollutant	Allowables (tpy)
PM	86.5
SO_2	2816.9
NO_x	2920.3
CO	430.1
VOC	430.1
Lead	0.13
HAP	247.2

The modification to the certification consists of incorporating the activities authorized by PSD –FL-263 and PSD-FL-194C as well as updating rule citings which have been changed. PSD-FL-194C allows the testing of petcoke and PSD-FL-263 authorizes the construction of two 165 MW combustion turbine electric generators and two 114 foot stacks.

Pages 1 through 15 reflect the updated rule citings.

Pages 15 through 19 incorporate the conditions of PSD-FL-194C and pages 19 through 34 incorporate PSD-FL-263. The conditions of these PSD permits are incorporated into the Power Plant Certification for the Polk Power Station verbatim.

EPC staff has noted the following inconsistency in the permit on page 22, paragraph no.1. The specific condition indicates that natural gas or a maximum of 0.5 % sulfur fuel oil or superior grade of distillate fuel oil shall be fired in the unit. On pages 24 and 27, paragraphs (d)(1) and (5) respectively, indicate that SO_2 and sulfuric acid mist is controlled by using pipeline natural gas or low sulfur oil (0.05% sulfur). It appears the facility must use low sulfur content fuel oil to meet compliance but paragraph no. 1, page 22 seems to indicate the facility can use fuel oil with a sulfur content of 0.5 %.

EPC staff periodically receives courtesy copies from FDEP concerning projects which have the potential to impact Hillsborough County, and EPC staff will continue to monitor future actions as we receive notification.

rsk

cc: Al Linero, FDEP

Petcoke Fuel Emissions Test
Polk Power Station
Unit No. 1
February 7, 2000 through April 26, 2000
Sulfuric Acid Mist, Sulfur Dioxide, Opacity
Oxides of Nitrogen and Fuel Analysis

Tampa Electric Company

May 26, 2000

Gregory M. Nelson, P.E.
Florida License No. 44078

REPORT CERTIFICATION

I have reviewed the test performance, the resulting calculations, and contents of this report, and verified that all project quality objectives have been met.

Date 6/7/2000 Signature

Senior Environmental Technician
Air Services
Environmental Affairs
Tampa Electric Company

I have calculated and compiled all data in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 6/7/00 Signature

Test Report Author
Coordinator-Air Services
Environmental Affairs
Tampa Electric Company

The sampling and analysis performed for this report were carried out under my direction and, and I hereby certify that this test is authentic and accurate.

Date 6/7/00 Signature

Test Team Leader
Environmental Technician
Air Services
Environmental Affairs
Tampa Electric Company

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 6/8/00 Signature

Administrator-Air Programs
Environmental Affairs
Tampa Electric Company

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APPENDICES

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1.0 INTRODUCTION

The Environmental Affairs, Air Services group of Tampa Electric Company performed a series of emission tests during the Petcoke test burn on Unit No. 1 at the Polk Power Station. The emission tests were conducted to measure pollutant emissions while firing syngas that was gasified from a blend of Petcoke and coal.

The Florida Department of Environmental Protection issued a letter of authorization to Tampa Electric Company for these emission tests to be conducted at Polk Power Station Unit No. 1, (operating permit No. 1050233-001-AV, Airs # 1050233). The test burn authorization included a Baseline Test firing syngas that was gasified with 100% coal and a series of Fuel Blend Petcoke Tests (Blend Tests) firing syngas that was gasified from a fuel blend of up to 70% Petcoke.

The Baseline stack test was performed on February 7, 2000 and February 8, 2000. The Fuel Blend test of 60% Petcoke and 40% coal was performed on April 24th, 25th and 26th, 2000. Operational data during the baseline and fuel blend testing can be found in Appendix C.

Unit No. 1 is an integrated coal gasification combined cycle (IGCC) generating unit. The combustion turbine is normally fired with syngas. Nitrogen Oxides, Sulfur Dioxide and Opacity data were measured and recorded using Continuous Emission Monitoring System (CEMS) during the Baseline and Fuel Blend Tests. All emission tests were performed following the procedures and quality control guidelines given in 40 CFR 60 Appendix A -Test Methods.

The Sulfuric Acid Mist (H_2SO_4) emissions rate for the baseline test was derived from 8 test runs. The calculated average was 0.018 lbs/MMBtu. The ninth run was not completed due to turbine failure, which resulted in the unit coming off line. The H_2SO_4 emissions rate for the blend test was derived from 9 test runs. The calculated average during the blend was 0.011 lbs/MMBtu.

The sulfur dioxide (SO_2) emissions rate for the baseline test was derived from a 2-day daily CEMS average. The calculated average during the baseline test was 0.176 lbs/MMBtu. The sulfur dioxide (SO_2) emissions rate for the blend test was derived from a 3-day daily CEMS average during the blend test period. The calculated average during the blend was 0.133 lbs/MMBtu.

The nitrogen oxides (NOx) emissions rate for the baseline test was derived from a 2-day daily CEMS average. The calculated average during the baseline test was 0.093 lbs/MMBtu. The nitrogen oxides (NOx) emissions rate for the blend test was derived from a 3-day daily CEMS average during the blend test period. The calculated average during the blend was 0.097 lbs/MMBtu.

The SO_2 and NO_X averages were calculated on a daily CEMS average for each test period. Due to the short run time period on the Petcoke blend, a 30-day rolling average comparison in lbs/hr was not possible.

The average opacity for the baseline test was 1.3% and the blend test was 4.4%. The FDEP allowable rate for opacity is 20%. Increases in opacity from the baseline test period to the fuel blend test period are primarily caused by lense fouling on the opacity monitor as well as misalignment of the monitor itself. Differences in ambient temperatures cause the stack metal to expand and contract which, ultimately, results in an inelastic structural distortion in the brackets that fix the monitor to the stack. This distortion causes monitor misalignment which, in turn, results in opacity measurements that trend upward with time and can only be corrected through monitor realignment. In correspondence dated September 15, 1999, to Dr. Richard D. Garrity of FDEP, Tampa Electric Company explained this phenomenon to FDEP. To address this issue, The Company realigns the monitor whenever Polk Unit 1 is offline for a maintenance outage greater than 24 hours in duration.

Section 2.0 presents a brief source description and diagram of the sample point locations.

Section 3.0 outlines the procedures and test methods used along with diagrams of sampling trains used.

Section 4.0 presents the test results and comparison tables.

All supporting documentation, field data sheets, laboratory data, sample calculations, calibration data, and quality assurance/quality control measures are included in the appendices to this report.

2.0 SOURCE DESCRIPTION

Polk Power Station is located at County Road 630 approximately 13 miles southwest of Bartow in Polk County, Florida. Unit No. 1 is an integrated coal gasification combined cycle (IGCC) generating unit. It's net capacity is 192 MW when fired with Syngas fuel. The source sampling location consists of a circular stack 19 ft. in diameter with four sample ports located 90° apart on the stack circumference. A diagram of the stack sampling location is included in Figure 1 along with other pertinent information on the test site.

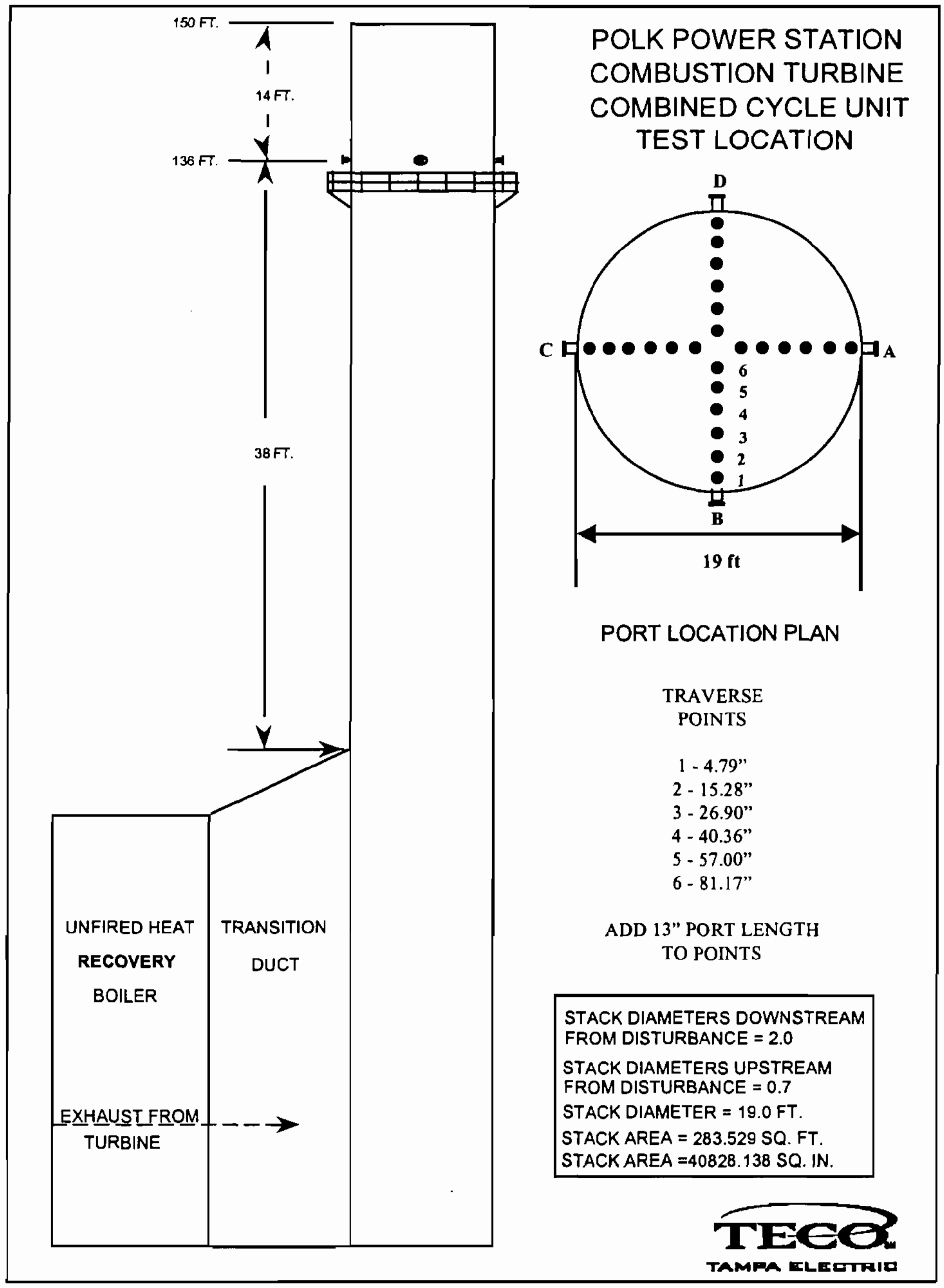
150 FT.
14 FT.
136 FT.
38 FT.
POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION
D
C
A
B
6
5
4
3
2
1
19 ft
PORT LOCATION PLAN
TRAVERSE
POINTS
1 - 4.79"
2 - 15.28"
3 - 26.90"
4 - 40.36"
5 - 57.00"
6 - 81.17"
ADD 13" PORT LENGTH
TO POINTS
STACK DIAMETERS DOWNSTREAM
FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM
FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.
UNFIRED HEAT
RECOVERY
BOILER
TRANSITION
DUCT
EXHAUST FROM
TURBINE
TECO
TAMPA ELECTRIC

FIGURE 1

3.0 TEST PROCEDURES/SAMPLING TRAIN DIAGRAMS

Sulfuric Acid Mist sampling was performed according to U.S. EPA Method 8 "Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources". Sampling was performed using the equipment depicted on Figure 2.

Sulfur Dioxide (SO_2), Nitrogen Oxides (NO_x) and Opacity emissions were taken from the Continuous Emissions Monitoring System (CEMS) readings.

Gas sampling and analysis was performed according to U.S. EPA Method 3-B "Gas Analysis for Determination of Emission Rate Correction Factor, or Excess Air ". Sampling was performed using the equipment depicted in Figure 3 and 4.

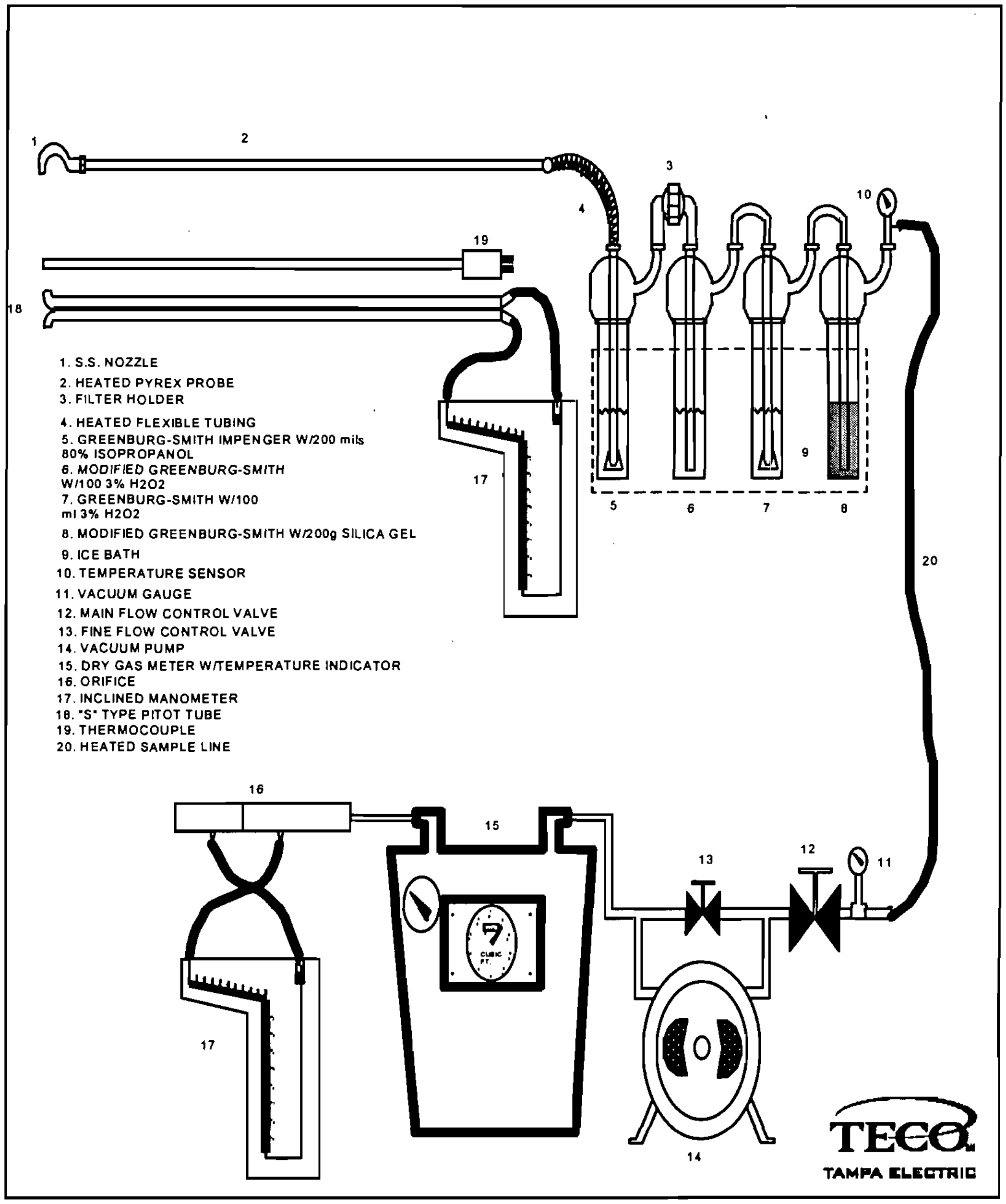

FIGURE 2
SULFURIC ACID MIST SAMPLING TRAIN
USEPA METHOD 8

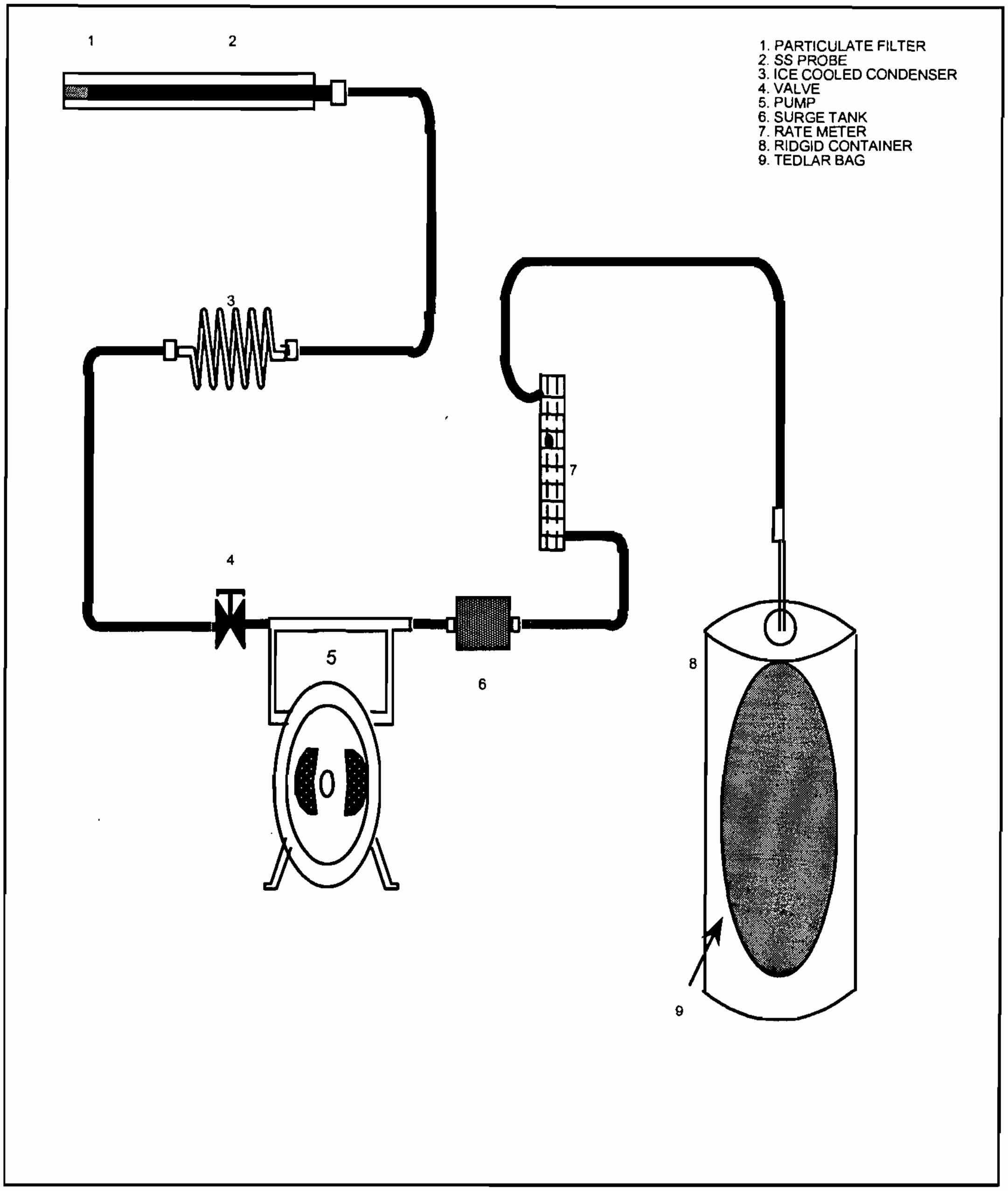

FIGURE 3

INTEGRATED GAS SAMPLING TRAIN

USEPA METHOD 3-B

TECO
TAMPA ELECTRIC

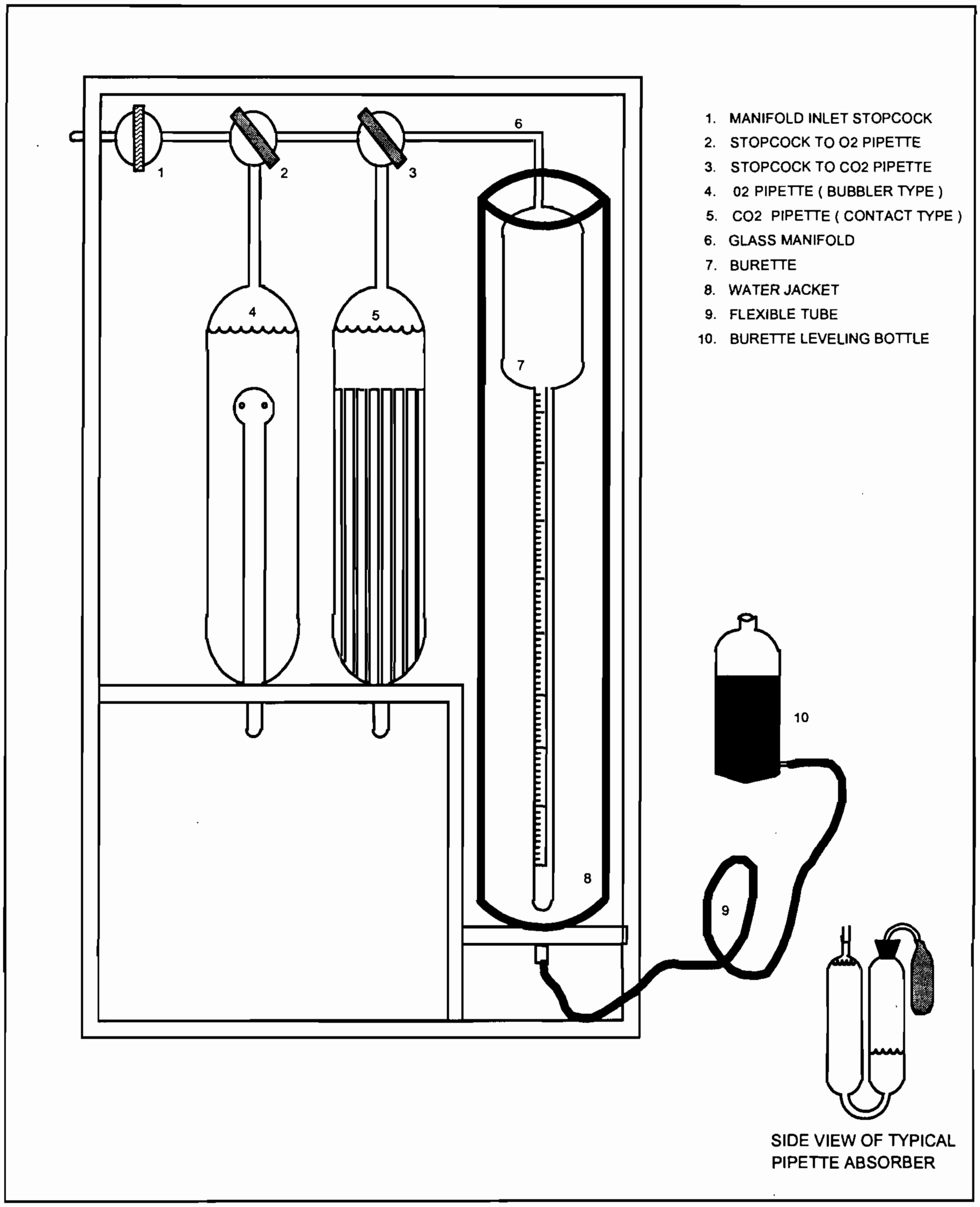

FIGURE 4

ORSAT ANALYZER

USEPA METHOD 3-B

TECO
TAMPA ELECTRIC

4.0 SUMMARY OF RESULTS

Table 1 presents the Continuous Emission Monitoring System (CEMS) data from the Baseline Test and the Fuel Blend Test. Data is presented comparing SO_2, NO_x and Opacity during Baseline and Fuel Blend Tests.

TABLE 1
POLK POWER STATION UNIT NO. 1
CONTINUOUS EMISSION MONITORING SYSTEM DATA

PARAMETER	BASELINE	FUEL BLEND	EMISSION RATE
SO_2	0.176	0.133	lbs/MMBtu
NO_x	0.093	0.097	lbs/MMBtu
Opacity	1.3	4.4	%

Table 2 presents stack test data from the Baseline Test and the Fuel Blend Test comparing Sulfuric Acid Mist test levels.

TABLE 2
POLK POWER STATION UNIT NO. 1
STACK TEST DATA

PARAMETER	BASELINE	FUEL BLEND	EMISSION RATE
H_2SO_4	0.018	0.011	lbs/MMBtu

Table 3 represents Fuel Analysis data from Appendix E for Baseline vs. Blend tests.

TABLE 3 POLK POWER STATION UNIT NO. 1 FUEL ANALYSIS DATA			
PARAMETER	Coal Baseline	40% Coal 60% Petcoke Blend	Units
Total Moisture	12.9	6.98	%
Ash, as Received	8.97	3.90	%
BTU, as Received	11313	13535	Btu/Lbs
Sulfur, as Received	2.88	2.88	%
BTU, Moisture-Ash Free, Calc	14479	15187	Btu/Lb
Pounds SO2/Million BTU, Coal	4.84	4.05	Lb/MMBtu
Ash, Dry Basis	10.3	4.19	%
BTU, Dry Basis	12988	14551	Btu/Lb
Sulfur, Dry Basis	3.31	3.10	%
Carbon, as Received	63.16	77.51	%
Hydrogen, as Received	4.33	4.14	%
Nitrogen, as Received	1.39	1.82	%
Oxygen, as Received (Calculated)	6.27	2.69	%
Carbon, Dry Basis	72.51	83.33	%
Hydrogen, Dry Basis	4.97	4.45	%
Nitrogen, Dry Basis	1.60	1.96	%
Oxygen, Dry Basis (Calculated)	7.19	2.88	%
Chlorine by Bomb/IC, as Received	0.10	0.08	%
Chlorine by Bomb/IC, Dry Basis	0.12	0.09	%
Volatiles, Dry Basis	39.05	23.60	%
Volatiles, as Received	34.01	21.95	%

UNIT OPERATIONS SUMMARY

Fuel sample composites were taken for coal and Petcoke/coal blends during barge loading prior to leaving the port. A certified laboratory performed all analysis and details are included in Appendix E.

Operational data during the baseline and fuel blend testing can be found in Appendix C.

SOURCE SAMPLING NOMENCLATURE

A	=	Absorbance of sample.
A_n	=	Cross-sectional area of nozzle, m5 (ft5).
A_s	=	Cross-sectional area of stack, m5 (ft5).
B_{ws}	=	Water vapor in the gas steam, proportion by volume.
C	=	Concentration of particulate matter, (lbs/dscf), Method 5,17.
C	=	Concentration of NO_x, as NO_2, basis, corrected to standard conditions, mg/dscm (lbs/dscf), Method 7.
C_a	=	Concentration of acetone blank residue, mg/g.
$CH_2\ SO_4$	=	Sulfuric acid (including SO_3) concentration, g/dscm (lbs/dscf).
C_p	=	Pitot tube coefficient, dimensionless.
c_s	=	Concentration of stack gas particulates, dry basis corrected to standard conditions, g/dscm (lbs/dscf).
CSO_2	=	Sulfur dioxide concentration, mg/dscm (lbs/dscf).
E	=	Pollutant emissions, lbs/10^6 Btu.
EM	=	Particulate emission rate, lbs/hr.
F	=	Factor ratio of generated flue gases to calorific value of fuel, Method 5,17.
F	=	Dilution factor (i.e., 25/5, 25/10, etc.) required only if sample dilution was needed to reduce the absorbance to the range of calibration, Method 7.
FDA	=	Fraction of dry air.
I	=	Percent of isokinetic sampling, %.
K_c	=	Spectrophotometer calibration factor.
K_p	=	Pitot tube constant,

$$34.97m/\sec\left[\frac{(g/g\text{-}mole)(mmHg)}{(°K)(mmH20)}\right]1/2$$

Metric

$$85.49ft/\sec\left[\frac{(lb/lb\text{-}mole)('' Hg)}{(^\circ K)(mmH2O)}\right]1/2$$

English

L_a = Maximum acceptable leakage rate for either a pretest leak check or a leak check following a component change; equal to 0.00057 m^3/min (0.02 ft^3/min) or 4% of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak check conducted prior to the "ith" component change (i = 1, 2, 3,...n), m^3/min (ft/min).

L_p = Leakage rate observed during the post test leak check, m^3/min (ft^3/min).

m = Mass of NO_x as NO_2 in gas sample, :g.

m_a = Mass of acetone residue after evaporation, mg.

M_d = Molecular weight of stack gas, dry basis, g/g-mole (lb/lb-mole).

m_f = Filter weight gain, mg.

m_n = Total amount of particulate collected, mg.

M_s = Molecular weight of stack gas, wet basis, g/g-mole (lb/lb-mole), or $M_d(1 - B_{ws}) = 18.0\ B_{ws}$.

M_w = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

N = Normality of $Ba(ClO_4)_2 \cong 3H_2O$ titrant, g-eq/l.

N = Normality of barium perchlorate titrant, meq/ml.

P_a = Density of acetone, mg/ml (see bottle label).

P_{bar} = Barometric pressure at sampling site, mm Hg (in. Hg).

P_f = Final absolute pressure of flask, mm Hg (in. Hg).

P_g = Stack static pressure, mm Hg (in. Hg).

P_i = Initial absolute pressure of flask, mm Hg (in. Hg).

P_s = Absolute stack pressure, 760 mm Hg (29.92 in. Hg).

P_w = Density of water, 0.9982 g/ml (0.0022 lb/ml).

Q_s = Volumetric flow rate, actual cubic feet per min, acf/min.

Q_{std} = Dry volumetric stack gas flow rate corrected to standard conditions dsm^3/hr (dscf/hr).

R = Ideal gas constant, 0.06236 (mm Hg - m^3)/(EK - g - mole) for metric units and 21.85 (in. Hg - ft^3)(ER - 1b - mole) for English units.

S.V.P. = Saturated vapor pressure of water at average stack temperature mm Hg (in. Hg).

T_f = Final absolute temperature of flask, K (ER).

T_i = Initial absolute temperature of flask, K (ER).

T_m = Absolute average dry gas meter temperature, K (ER).

t_s = Stack temperature, EC (EF).

T_s = Absolute stack temperature, K (ER), or 273 + t_s for metric system or 460 + t_s for English system.

T_{std} = Standard absolute temperature, 293K (528ER).

V_a = Volume of acetone blank, ml, (Method 5,17).

V_a = Volume of sample aliquot titrated, ml, (Method 6).

V_a = Volume of absorbing solution, 25 ml, (Method 7).

V_a = Volume of sample aliquot titrated, 100 ml for H_2SO_4 and 10ml for SO_2 (Method 8).

V_{aw} = Volume of acetone used in wash, ml.

V_f = Final volume of condenser water, ml.

V_f = Volume of flask and valve, ml.

V_i = Initial volume of condenser water, ml.

V_{ic} = Total volumes of liquid and silica gel collected in impingers, ml.

V_m = Dry gas volume measured by dry gas meter, scm (dcf).

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter and corrected to standard condition, dscm (dscf).

v_s = Average stack gas velocity calculated by Method 2, m/sec (ft/sec).

V_{sc} = Sample volume at standard conditions (dry basis), ml.

V_{soln} = Total volume of solution in which the sulfur dioxide sample is contained, 100 ml, (method 6).

V_{soln} = Total volume of solution in which the H_2SO_4 or SO_2 sample is contained, 250 ml or 1000 ml, respectively, (Method 8).

V_t = Volume of $Ba(ClO_4)_2 \cong 3H_2O$ titrant used for the sample, ml, (Method 8).

V_t = Volume of barium perchlorate titrant used for the sample (average of replicate titrations), ml, (Method 6).

V_{tb} = Volume of barium perchlorate titrant used for the blank, ml.

$V_{w(std)}$ = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).

$V_{wc(std)}$	=	Volume of condensed water vapor, corrected to standard conditions, sm^3(scf).
$V_{wsg(std)}$	=	Volume of water vapor collected in silica gel, corrected to standard conditions, sm^3 (scf).
W_a	=	Weight of acetone wash residue, mg.
W_f	=	Final weight of silica gel or silica gel plus impinger, g.
W_i	=	Initial weight of silica gel or silica gel plus impinger, g.
Y	=	Dry gas meter calibration factor.
)H	=	Average pressure differential across the orifice meter, mm (in) H_2O.
)H@	=	Measurement of pressure differential across the orifice meter, mm (in.) H_2O.
)p	=	Average velocity head of stack gas, mm (in.) H_2O.
)V_m	=	Incremental volume measured by dry gas meter at each traverse point, dm^3 (dcf).
%CO	=	Percent CO by volume (dry basis), average of three CO values.
%CO_2	=	Percent CO_2 by volume (dry basis), average of three analyses.
%EA	=	Percent excess air, %.
%N_2	=	Percent N_2 by volume (dry basis), average of three N_2 values.
%O_2	=	Percent O_2 by volume (dry basis), average of three O_2 values.
0.262	=	Ratio of O_2 to N_2 in air, v/v.
2	=	50/25, the aliquot factor, (Method 7).
13.6	=	Specific gravity of mercury (Hg).
18.0	=	Molecular weight of water, g/g-mole (lb/lb-mole).
32.03	=	Equivalent weight of sulfur dioxide.
60	=	Seconds per minute (sec/min).
100	=	Conversion to percent, %.
3600	=	Conversion factor, (sec/hr).
2	=	Total sampling time, min.
2_I	=	Interval of sampling time from beginning of a run until first component change, min.
2_i	=	Interval of sampling time between two successive component changes, beginning with first and second changes, min.
2_p	=	Interval of sampling time from final (nth) component change until the end of the sampling run, min.

APPENDIX A

SOURCE TEST CALCULATIONS

A-1 BASELINE SULFURIC ACID MIST CALCULATIONS

A-2 FUEL BLEND SULFURIC ACID MIST CALCULATIONS

A-1 BASELINE SULFURIC ACID MIST CALCULATIONS

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Test Summary

Plant: Polk Power Station
Date: 02/07/00 -02/08/00
Sampling Location: Stack
Operating Conditions: Baseload

	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Average
Gas Flow Rate									
acfm	1366047.5	1374893.7	1370300.5	1370300.5	1355840.5	1360433.6	1351247.3	1364006.1	1364133.7
dscfm	866391.5	864442.5	865226.9	861984.7	850867.9	853857.7	850877.5	855426.6	858634.4
Average Stack Temperature, °F	335.8	334.7	333.0	331.3	335.7	335.6	336.0	336.0	334.8
% Isokinetic	98.1	100.1	99.9	101.5	103.5	102.2	101.4	100.2	100.9
Moisture, %H2O	4.6	5.4	5.2	5.6	5.3	5.3	5.1	5.2	5.2
Sampled Volume, dscf	39.622	40.351	40.317	40.788	41.038	40.720	40.251	39.976	40.383
Condensate Volume, ml	40.6	49.1	46.8	51.4	49.2	48.3	46.0	46.4	47.2
Meter Temperature, °F	83.6	83.5	82.9	73.5	61.4	66.6	75.0	81.0	75.9
C_{H2SO4}, lb/dscf	5.172E-07	6.034E-07	5.707E-07	7.124E-07	4.759E-07	5.913E-07	6.315E-07	7.295E-07	6.0399E-07
$E_{H2SO4} = C_{H2SO4} \times$ F-factor, lbs/MMBtu	0.015	0.018	0.017	0.021	0.014	0.017	0.018	0.021	0.018

F-factor is calculated from flow data during testing and DCS data Heat Input on a run/run basis.

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 1

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.05 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.98 " Hg	Average Orifice Meter, ΔH:	1.436 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.924 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	83.6 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	335.8 °F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.173 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	40.6 ml
	80.2 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	1.914 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.622 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.046 %
$FDA = 1.0 - B_{ws}$	0.954 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%\,CO))$	29.75 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.21 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.3 ft/second
$Q_s = v_s \times A_s \times 60$	1366047.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	866391.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	98.1 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29452.40 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	3.88 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.172E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.015 lb/MMBtu

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Run Number 2

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.00 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.93 " Hg	Average Orifice Meter, ΔH:	1.468 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.736 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	83.5 °F
Gas Analysis:	8.2 % CO_2	Average Stack Temp., T_s:	334.7 °F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.179 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	49.1 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.315 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.351 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.054 %
$FDA = 1.0 - B_{ws}$	0.946 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.78 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.82 ft/second
$Q_s = v_s \times A_s \times 60$	1374893.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	864442.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	100.1 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29386.15 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.6 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	6.034E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.018 lb/MMBtu

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Run Number 3

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.00 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.93 " Hg	Average Orifice Meter, ΔH:	1.46 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.655 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	82.9 ^oF
Gas Analysis:	8.2 % CO_2	Average Stack Temp., T_s:	333 ^oF
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.177 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	46.8 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.206 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.317 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%\ CO))$	29.78 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.17 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460)} / (M_s \times P_s)$	80.55 ft/second
$Q_s = v_s \times A_s \times 60$	1370300.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	865226.9 dscf/minute
$1 = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	99.9 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	**29412.81** dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.35 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.707E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.017 lb/MMBtu

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Run Number 4

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.88 " Hg	Average Orifice Meter, ΔH:	1.445 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.483 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	73.5 ^oF
Gas Analysis:	8.4 % CO_2	Average Stack Temp., T_s:	331.3 ^oF
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.177 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	51.4 ml
	79.8 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.423 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.788 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.056 %
$FDA = 1.0 - B_{ws}$	0.944 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.82 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.16 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460)} / (M_s \times P_s)$	80.55 ft/second
$Q_s = v_s \times A_s \times 60$	1370300.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	861984.7 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.5 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29302.60 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	5.48 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	7.124E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.021 lb/MMBtu

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Run Number 5

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.88 " Hg	Average Orifice Meter, ΔH:	1.38 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.797 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	61.4 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	335.7 °F
	12.0 % O_2	Average √Δp:	1.161 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	49.2 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.319 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	41.038 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.053 %
$FDA = 1.0 - B_{ws}$	0.947 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.7 ft/second
$Q_s = v_s \times A_s \times 60$	1355840.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	850867.9 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	103.5 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	**28924.69** dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	3.7 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.759E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.014 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 6

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.88 " Hg	Average Orifice Meter, ΔH:	1.388 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	40.883 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	66.6 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	335.6 °F
	12.0 % O_2	Average √Δp:	1.165 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	48.3 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.277 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.72 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.053 %
$FDA = 1.0 - B_{ws}$	0.947 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.97 ft/second
$Q_s = v_s \times A_s \times 60$	1360433.6 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	853857.7 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.2 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29026.32 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.55 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.913E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.017 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 7

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.00 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.93 " Hg	Average Orifice Meter, ΔH:	1.398 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	40.988 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	75.0 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	336.0 °F
	11.8 % O_2	Average √Δp:	1.158 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	46.0 ml
	80.2 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.168 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.251 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.051 %
$FDA = 1.0 - B_{ws}$	0.949 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%\,CO))$	29.75 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.15 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.43 ft/second
$Q_s = v_s \times A_s \times 60$	1351247.3 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	850877.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.4 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	28925.01 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.8 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	6.315E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.018 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 8

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.91 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.84 " Hg	Average Orifice Meter, ΔH:	1.418 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.286 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	81.0 ^{o}F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	336.0 ^{o}F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.167 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	46.4 ml
	80.2 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.187 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.976 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.75 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.18 ft/second
$Q_s = v_s \times A_s \times 60$	1364006.1 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	855426.6 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	100.2 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29079.66 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	5.5 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	7.295E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.021 lb/MMBtu

A-2 FUEL BLEND SULFURIC ACID MIST CALCULATIONS

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Test Summary

Plant: Polk Power Station
Date: 4-24-00 To 4-26-00
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

	Run #1	Run #2	Run #3	Run #6	Run #7	Run #8	Run #9	Run #10	Run #11	Average
Gas Flow Rate										
acfm	1408917.3	1405174.7	1425418.7	1363665.9	1360773.9	1357031.3	1357031.3	1385270.9	1390884.8	1383797
dscfm	872528.9	866398.3	881799.7	856027.9	853858	860571.4	860571.4	873817.2	873322.5	866544
Average Stack Temperature, °F	320.7	320	321.3	322	321.0	321.8	321.8	324.5	324.8	322.0
% Isokinetic	104.0	105.8	99	103	102.4	102	102	102.3	101.9	102.5
Moisture, %H2O	5.2	5.7	4.9	5.8	5.8	4.7	4.7	5.2	5.6	5.3
Sampled Volume, dscf	42.321	42.76	40.705	41.144	40.782	40.927	40.927	41.698	41.51	41.419
Condensate Volume, ml	49.4	54.9	44.5	53.3	53.2	43.1	43.1	48.6	52.4	49.2
Meter Temperature, °F	80.4	86.7	84.6	88.1	89.0	86.5	86.5	72.8	80.4	83.9
C_{H2SO4}, lb/dscf	3.457E-07	2.17E-07	8.72E-08	5.666E-07	4.712E-07	4.243E-07	5.189E-07	4.085E-07	4.392E-07	3.86511E-07
$E_{H2SO4} = C_{H2SO4}$ x F-factor, lbs/MMBtu	0.010	0.006	0.003	0.017	0.014	0.013	0.015	0.012	0.013	0.011

F-factor is calculated from flow data during testing and DCS data Heat Input on a run/run basis.

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 1

Plant: Polk Power Station
Date: 04/24/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.50 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	28.9 " Hg	Average Orifice Meter, ΔH:	1.544 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	43.72 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	80.4 °F
Gas Analysis:	7.0 % CO_2	Average Stack Temp., T_s:	320.7 °F
	12.0 % O_2	Average √Δp:	1.195 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	49.4 ml
	81.0 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.329 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	42.321 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%\,CO))$	29.6 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	82.82 ft/second
$Q_s = v_s \times A_s \times 60$	1408917.3 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	872528.9 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	104.0 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	30087.20 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0 ml
Volume Titrant Sample, V_t	2.68 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	3.457E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.010 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 2

Plant: Polk Power Station
Date: 04/24/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.50 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	28.9 " Hg	Average Orifice Meter, ΔH:	1.553 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	44.687 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	86.7 °F
Gas Analysis:	7.0 % CO_2	Average Stack Temp., T_s:	320 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.191 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	54.9 ml
	81.0 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.588 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	42.76 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.057 %
$FDA = 1.0 - B_{ws}$	0.943 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.6 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	28.94 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	82.6 ft/second
$Q_s = v_s \times A_s \times 60$	1405174.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	866398.3 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	105.8 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	**29875.80** dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0 ml
Volume Titrant Sample, V_t	1.7 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	2.170E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.006 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 3

Plant: Polk Power Station
Date: 04/24/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.40 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	28.8 " Hg	Average Orifice Meter, ΔH:	1.569 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	42.518 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	84.6 °F
Gas Analysis:	7.0 % CO_2	Average Stack Temp., T_s:	321.3 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.207 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	44.5 ml
	81.0 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.098 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.705 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.049 %
$FDA = 1.0 - B_{ws}$	0.951 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%\ CO))$	29.6 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.03 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	83.79 ft/second
$Q_s = v_s \times A_s \times 60$	1425418.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	881799.7 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	99 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	30406.89 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0 ml
Volume Titrant Sample, V_t	0.65 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	8.720E-08 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.003 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 6

Plant: Polk Power Station
Date: 04/25/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.60 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.53 " Hg	Average Orifice Meter, ΔH:	1.47 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	42.972 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	88.1 °F
Gas Analysis:	8.1 % CO_2	Average Stack Temp., T_s:	322 °F
	13.3 % O_2	Average $\sqrt{\Delta p}$:	1.171 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	53.3 ml
	78.6 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E-02 \times V_{lc}$	2.513 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	41.144 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.058 %
$FDA = 1.0 - B_{ws}$	0.942 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.83 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.16 ft/second
$Q_s = v_s \times A_s \times 60$	1363665.9 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	856027.9 dscf/minute
$I = (T_s + 460) \times ((2.67E-03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	103 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29518.20 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0.01 ml
Volume Titrant Sample, V_t	4.28 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E-04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.666E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.017 lb/MMBtu

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 7

Plant: Polk Power Station
Date: 04/25/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.55 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.48 " Hg	Average Orifice Meter, ΔH:	1.456 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	42.737 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	89.0 ^{o}F
Gas Analysis:	7.7 % CO_2	Average Stack Temp., T_s:	321.0 ^{o}F
	13.1 % O_2	Average $\sqrt{\Delta p}$:	1.167 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	53.2 ml
	79.2 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.508 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.782 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.058 %
$FDA = 1.0 - B_{ws}$	0.942 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%\,CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.08 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.99 ft/second
$Q_s = v_s \times A_s \times 60$	1360773.9 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	853858 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.4 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29443.38 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0.01 ml
Volume Titrant Sample, V_t	3.53 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.712E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.014 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 8

Plant: Polk Power Station
Date: 04/25/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.55 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.48 " Hg	Average Orifice Meter, ΔH:	1.461 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	42.799 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	89.8 ^{o}F
Gas Analysis:	7.8 % CO_2	Average Stack Temp., T_s:	321.3 ^{o}F
	13.0 % O_2	Average $\sqrt{\Delta p}$:	1.167 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	47.8 ml
	79.2 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.253 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.782 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.77 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.16 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.89 ft/second
$Q_s = v_s \times A_s \times 60$	1359072.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	857892.8 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29582.51 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0.01 ml
Volume Titrant Sample, V_t	3.18 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.243E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.013 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 9

Plant: Polk Power Station
Date: 04/25/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.5 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.48 " Hg	Average Orifice Meter, ΔH:	1.46 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	42.766 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	86.5 °F
Gas Analysis:	7.8 % CO_2	Average Stack Temp., T_s:	321.8 °F
	13.0 % O_2	Average $\sqrt{\Delta p}$:	1.166 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	43.1 ml
	79.2 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.032 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.927 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.047 %
$FDA = 1.0 - B_{ws}$	0.953 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.77 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.22 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.77 ft/second
$Q_s = v_s \times A_s \times 60$	1357031.3 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	860571.4 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	29674.88 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0.01 ml
Volume Titrant Sample, V_t	3.9 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.189E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.015 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 10

Plant: Polk Power Station
Date: 04/26/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.65 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.58 " Hg	Average Orifice Meter, ΔH:	1.476 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	42.263 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	72.8 ^oF
Gas Analysis:	7.8 % CO_2	Average Stack Temp., T_s:	324.5 ^oF
	13.0 % O_2	Average $\sqrt{\Delta p}$:	1.189 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	48.6 ml
	79.2 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.291 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	41.698 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.77 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.16 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	81.43 ft/second
$Q_s = v_s \times A_s \times 60$	1385270.9 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	873817.2 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.3 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	30131.63 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0.01 ml
Volume Titrant Sample, V_t	3.13 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.085E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.012 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 11

Plant: Polk Power Station
Date: 04/26/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 2

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.65 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.58 " Hg	Average Orifice Meter, ΔH:	1.49 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	42.671 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	80.4 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	324.8 °F
	11.6 % O_2	Average √Δp:	1.192 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	52.4 ml
	80.4 % N_2	Meter Box Y:	1.001 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.47 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	41.51 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.056 %
$FDA = 1.0 - B_{ws}$	0.944 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.74 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.08 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)})$	81.76 ft/second
$Q_s = v_s \times A_s \times 60$	1390884.8 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	873322.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.9 %
Calculated F-factor= $Q_{s(std)}$ / Heat Input	30114.57 dscf/MMBtu

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0101 meq/ml
Volume Titrant Blank, V_{tb}	0.01 ml
Volume Titrant Sample, V_t	3.35 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.392E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times$ F-factor	0.013 lb/MMBtu

APPENDIX B

LABORATORY ANALYTICAL DATA

B-1 BASELINE SULFURIC ACID MIST LABORATORY DATA

B-2 FUEL BLEND SULFURIC ACID MIST LABORATORY DATA

B-1 BASELINE SULFURIC ACID MIST LABORATORY DATA

TECO TAMPA ELECTRIC
Corporate Environmental
Laboratory Services

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Report For: David Smith, Air Programs

Report Date: 02/08/00

Laboratory ID: AA53532

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant

Sampled By: R. BARTHELETTE
Date Sampled: 02/07/00
Time Sampled: 11:56:00 AM

POLK STACK TEST
BASELINE FOR PETCOKE TEST BURN

Laboratory Results

Parameter	Result	Units	MDL	Method
Normality of BaCl2 * 2H2O	0.0099		0.0001	
SO3, Avg. of Blank Titrations	0.05	milliliters	0.01	EPA - Meth.8
SO3, Run #1, Avg. of Titrations	3.88	milliliters	0.01	EPA - Meth.8
SO3, Run #2, Avg. of Titrations	4.60	milliliters	0.01	EPA - Meth.8
SO3, Run #3, Avg. of Titrations	4.35	milliliters	0.01	EPA - Meth.8
SO3, Run #4, Avg. of Titrations	5.48	milliliters	0.01	EPA - Meth.8
SO3, Volume of Contained Sample	500	milliliters	1	EPA - Meth.8
SO3, Volume of Sample Aliquot	100	milliliters	0.1	EPA - Meth.8

Comments:

Samples received at the lab were isopropanol solutions recovered from stack test for SO3 analysis.

Robert Dorey,
Supervisor of Laboratory Services

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Report For: David Smith, Air Programs

Report Date: 03/15/00

Laboratory ID: AA53545

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant
Project Account Code: L3
SAMPLE DESCRIPTION: ISOPROPANOL SOLUTION
RECOVERD FROM STACKTEST FOR SO3 ANALYSIS

Sampled By: R. BARTHELETTE
Date Sampled: 02/08/00
Time Sampled: 10:01:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of BaCl2 • 2H2O	0.0099		0.0001			
SO3, Avg. of Blank Titrations	0.05	milliliters	0.01			
SO3, Run #5, Avg. of Titrations	3.70	milliliters	0.01			
SO3, Run #6, Avg. of Titrations	4.55	milliliters	0.01			
SO3, Run #7, Avg. of Titrations	4.80	milliliters	0.01			
SO3, Run #8, Avg. of Titrations	5.50	milliliters	0.01			
SO3, Volume of Contained Sample	500	milliliters	1			
SO3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Robert Dorey,
Supervisor of Laboratory Services

B-2 FUEL BLEND SULFURIC ACID MIST LABORATORY DATA

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Report For: David Smith, Air Programs

Report Date: 04/28/00

Laboratory ID: AA54563

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant
Project Account Code: L16
SAMPLE DESCRIPTION:
60/40 PETCOKE BLEND

Sampled By: AIR PROGRAMS
Date Sampled: 04/24/00
Time Sampled: 12:00:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of BaCl2 * 2H2O	0.0101		0.0001			
SO3, Avg. of Blank Titrations	0.0	milliliters	0.01			
SO3, Run #1, Avg. of Titrations	2.68	milliliters	0.01			
SO3, Run #2, Avg. of Titrations	1.70	milliliters	0.01			
SO3, Run #3, Avg. of Titrations	0.65	milliliters	0.01			
SO3, Volume of Contained Sample	500	milliliters	1			
SO3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Robert Dorey,
Supervisor of Laboratory Services

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Report For: David Smith, Air Programs

Report Date: 04/28/00

Laboratory ID: AA54564

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant
Project Account Code: L16
SAMPLE DESCRIPTION:
60/40 PETCOKE BLEND

Sampled By: AIR PROGRAMS
Date Sampled: 04/25/00
Time Sampled: 12:00:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of BaCl2 * 2H2O	0.0101		0.0001			
SO3, Avg. of Blank Titrations	0.01	milliliters	0.01			
SO3, Run #6, Avg. of Titrations	4.28	milliliters	0.01			
SO3, Run #7, Avg. of Titrations	3.53	milliliters	0.01			
SO3, Run #8, Avg. of Titrations	3.18	milliliters	0.01			
SO3, Run #9, Avg. of Titrations	3.90	milliliters	0.01			
SO3, Volume of Contained Sample	500	milliliters	1			
SO3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Robert L. Dorey

Robert Dorey,
Supervisor of Laboratory Services

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Report For: David Smith, Air Programs

Report Date: 04/28/00

Laboratory ID: AA54565

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant
Project Account Code: L16
SAMPLE DESCRIPTION:
60/40 PETCOKE BLEND

Sampled By: AIR PROGRAMS
Date Sampled: 04/26/00
Time Sampled: 12:00:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of BaCl2 * 2H2O	0.0101		0.0001			
SO3, Avg. of Blank Titrations	0.01	milliliters	0.01			
SO3, Run #10, Avg. of Titrations	3.13	milliliters	0.01			
SO3, Run #11, Avg. of Titrations	3.35	milliliters	0.01			
SO3, Volume of Contained Sample	500	milliliters	1			
SO3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Robert Dorey,
Supervisor of Laboratory Services

APPENDIX C

<u>COMBUSTION TURBINE OPERATION DATA</u>

C-1 BASELINE OPERATIONAL DATA

C-2 FUEL BLEND OPERATIONAL DATA

C-1 BASELINE OPERATIONAL DATA

Baseline

POLK POWER STATION DCS DATA

Date	Time	Fuel To Slurry Preparation	Combustion Turbine Output (MW)	Net Output Generation (MW)	Diluent N2 To Turbine (KSCFH)	Fuel Flow To Turbine (KSCFH)	Fuel LHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (MMBTU/Hr)	NOx Emissions (Lb/Hr)	NOx Emissions (lb/MMBTU)	SO2 Emissions (Lb/Hr)	SO2 Emissions (lb/MMBTU)	Opacity %
02/07/00	10:00	Kentucky 9	191.8	248.7	5793	6607	247.2	267.7	1768	173.264	0.098	247.52	0.140	0.6
02/07/00	11:00	Kentucky 9	191.8	249.1	5816.0	6622	247.5	268	1774	175.626	0.099	266.1	0.150	1.3
02/07/00	12:00	Kentucky 9	191.8	251.0	5838.0	6623	247.4	267.8	1774	177.4	0.100	301.58	0.170	1.9
02/07/00	13:00	Kentucky 9	191.8	250.2	5852.0	6626	246.8	267.1	1770	178.77	0.101	300.9	0.170	1.6
02/07/00	14:00	Kentucky 9	191.8	249.9	5865.0	6642	245.7	265.8	1765	180.03	0.102	335.35	0.190	2.1
02/07/00	15:00	Kentucky 9	191.8	251.8	5859.0	6655	245.2	265.1	1764	179.928	0.102	335.16	0.190	2.3
02/07/00	16:00	Kentucky 9	191.8	251.6	5852.0	6662	244.8	264.6	1762	181.486	0.103	334.78	0.190	2.9
02/07/00	17:00	Kentucky 9	191.8	252.4	5843.0	6650	245	264.8	1761	177.861	0.101	352.2	0.200	1.5
02/07/00	18:00	Kentucky 9	191.8	251.1	5836.0	6642	245.5	265.3	1762	174.438	0.099	352.4	0.200	1.6
02/07/00	19:00	Kentucky 9	191.8	250.8	5832.0	6633	245.4	265.1	1759	172.382	0.098	316.62	0.180	1.1
02/08/00	8:00	Kentucky 9	191.3	251.1	5816.0	6718	243.5	263.4	1770	141.6	0.080	460.2	0.260	0.9
02/08/00	9:00	Kentucky 9	190.0	250.7	5832.0	6682	243.8	263.8	1763	142.803	0.081	282.08	0.160	0.8
02/08/00	10:00	Kentucky 9	190.0	249.1	5872.0	6677	244.1	264.2	1764	142.884	0.081	299.88	0.170	1.2
02/08/00	11:00	Kentucky 9	190.0	249.2	5896.0	6679	244.2	264.4	1766	144.812	0.082	282.56	0.160	1
02/08/00	12:00	Kentucky 9	190.0	249.6	5917.0	6681	244	264.3	1766	150.11	0.085	264.9	0.150	0.8
02/08/00	13:00	Kentucky 9	190.1	249.5	5937.0	6685	243.3	263.5	1761	149.685	0.085	281.76	0.160	0.5
02/08/00	14:00	Kentucky 9	190.0	249.9	5938.0	6672	243.4	263.6	1759	151.274	0.086	281.44	0.160	0.9
02/08/00	15:00	Kentucky 9	189.9	249.4	5927.0	6658	241.7	264.1	1758	154.704	0.088	298.86	0.170	0.9
		Average	191.1	250.3	5862.3	6656	244.9	265.1	1765	164	0.093	311	0.176	1.3

C-2 FUEL BLEND OPERATIONAL DATA

Blend 60%

POLK POWER STATION DCS DATA

Date	Time	Fuel To Slurry Preparation	Combustion Turbine Output (MW)	Net Output Generation (MW)	Diluent N2 To Turbine (KSCFH)	Fuel Flow To Turbine (KSCFH)	Fuel LHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (MMBTU/Hr)	NOx Emissions (Lb/Hr)	NOx Emissions (lb/MMBTU)	SO2 Emissions (Lb/Hr)	SO2 Emissions (lb/MMBTU)	Opacity %
04/24/00	9:00	60% Pet Coke	191.8	251.2	5887	6481	251.1	269.5	1747	191.7	0.110	197.5	0.113	3.4
04/24/00	10:00	60% Pet Coke	191.8	251.7	5865	6493	250.9	269.3	1749	195.1	0.112	208.4	0.119	3.1
04/24/00	11:00	60% Pet Coke	191.8	252.0	5863	6510	250.7	269.0	1751	198.9	0.114	235.5	0.134	3.7
04/24/00	12:00	60% Pet Coke	191.8	251.5	5991	6498	250.7	269.0	1748	185.7	0.106	241.0	0.138	3.7
04/24/00	13:00	60% Pet Coke	191.7	251.1	6143	6484	251.0	269.4	1747	184.6	0.106	243.8	0.140	3.9
04/24/00	14:00	60% Pet Coke	191.8	251.0	6272	6476	250.9	269.3	1744	174.9	0.100	236.5	0.136	4.0
04/24/00	15:00	60% Pet Coke	191.8	250.4	6287	6467	251.2	269.6	1743	166.0	0.095	241.3	0.138	4.1
04/24/00	16:00	60% Pet Coke	191.8	250.0	6284	6455	251.4	269.8	1742	160.6	0.092	236.6	0.136	4.2
04/24/00	17:00	60% Pet Coke	191.8	250.0	6281	6449	251.4	269.9	1741	158.9	0.091	231.3	0.133	4.3
04/24/00	18:00	60% Pet Coke	191.8	249.9	6278	6448	251.5	269.9	1740	160.0	0.092	237.4	0.136	4.3
04/25/00	12:00	60% Pet Coke	190.3	247.7	6301	6410	250.8	269.1	1725	155.3	0.090	245.2	0.142	5.4
04/25/00	13:00	60% Pet Coke	191.7	249.7	6332	6438	251.3	269.7	1736	156.5	0.090	240.4	0.138	5.3
04/25/00	14:00	60% Pet Coke	191.7	249.2	6362	6426	251.8	270.3	1737	161.5	0.093	244.4	0.141	5.3
04/25/00	15:00	60% Pet Coke	191.7	248.9	6392	6423	251.8	270.3	1736	161.8	0.093	250.2	0.144	5.4
04/25/00	16:00	60% Pet Coke	191.8	249.3	6423	6416	252.2	270.7	1737	164.0	0.094	254.8	0.147	5.6
04/25/00	17:00	60% Pet Coke	191.8	249.0	6450	6411	252.6	271.1	1738	162.6	0.094	253.4	0.146	5.9
04/25/00	18:00	60% Pet Coke	191.8	248.6	6444	6402	253.1	271.6	1739	160.8	0.092	249.1	0.143	5.4
04/25/00	19:00	60% Pet Coke	191.7	248.4	6428	6396	253.2	271.8	1738	157.7	0.091	239.4	0.138	5.3
04/26/00	10:00	60% Pet Coke	191.8	246.1	6584	6406	251.9	270.4	1732	158.7	0.092	185.5	0.107	2.9
04/26/00	11:00	60% Pet Coke	191.8	246.6	6603	6420	251.7	270.3	1735	158.4	0.091	191.7	0.110	3.0
04/26/00	12:00	60% Pet Coke	191.8	247.2	6622	6419	251.8	270.4	1736	156.6	0.090	194.2	0.112	3.4
		Average	191.7	249.5	6290.2	6444.2	251.6	270.0	1740.1	168.1	0.097	231.3	0.133	4.4

APPENDIX D

CONTINUOUS EMISSION MONITORING SYSTEM DATA

D-1 BASELINE CEMS STACK TESTS LOGS

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Polk Station
HRSG
Tampa

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Today's Date: 05/11/2000 Reporting Period
Time: 05:10:44 Day: 02/07/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
100	8	30.1	0.14	265.7	28.2	0.097	53172	1841
200	8	28.2	0.14	245.4	28.3	0.098M	52416M	1815
300	8	27.1	0.13	239.1	28.1	0.097	53160	1841
400	8	27.6	0.13	239.3	28.2	0.097	52230	1808
500	8	26.9	0.13	235.3	29	0.1	52692	1824
600	8	27.2	0.13	231.4	28.8	0.099	51252	1774
700	8	27.4	0.13	238	28.8	0.099	52326	1812
800	8.1	28.2	0.13	243.9	28.7	0.098	52104	1827
900	8.1	28.7	0.14	245	28.8	0.098	51432	1803
1000	8.1	30.9	0.15	272.8	29.2	0.099	53184	1864
1100	8.1	35	0.17	315.6	29.3	0.1	54312	1904
1200	8.1	36	0.17	342.3	29.6	0.101	57282	2008
1300	8	38.8	0.19	356.2	29.6	0.102	55296	1915
1400	8.1	40	0.19	363.9	30.1	0.102	54804	1921
1500	8.1	39.9	0.19	358.3	30.3	0.103	54090	1896
1600	8.1	41.8	0.2	377.9	29.7	0.101	54468	1909
1700	8.1	42.8	0.2	386.6	29	0.099M	54408M	1907
1800	8.2	38.9	0.18	339	29.1	0.098	52494	1863
1900	8.1	34.8	0.16	307.5	28.6	0.097	53238	1866
2000	8.2	35.8	0.17	315.5	28.4	0.096	53094	1884
2100	8.2	32.8	0.15	288.4	27.8	0.094	52962	1880
2200	8.2	30.9	0.14	272.7	27.2	0.091	53166	1887
2300	8.2	29.3	0.14	227.5	27.1	0.091M	46770M	1660
2400	8.1	31.6	0.15	257.2	27	0.092	49026	1719
AVRGE	8.1	32.9	0.156	290.2	28.7	0.098	52891	1852

Daily SO2 3.5 Tons
Daily CO2 5851.6 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error

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Polk Station
HRSG
Tampa

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Today's Date: 05/11/2000 Reporting Period
Time: 05:11:10 Day: 02/08/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
100	8.1	32.2	0.15	283.4	26.5	0.090M	53028M	1859
200	8.1	31.6	0.15	266	26.6	0.091	50712	1778
300	8.2	31.7	0.15	277.3	26.4	0.089M	52698M	1870
400	8.2	37.9	0.18	345.1	25.8	0.087	54858	1947
500	8.2	48.8	0.23	475.4	24.8	0.083	58686	2083
600	8.2	64.1	0.3	617.5	24.2	0.081	58032	2060
700	8.2	55.5	0.26	443.2	23.9	0.080M	48108M	1707
800	8.2	34.6	0.16	303.2	24.2	0.081	52794	1874
900	8.2	36.1	0.17	327.3	24.2	0.081	54624	1939
1000	8.2	33.7	0.16	304.9	24.4	0.082	54498	1934
1100	8.2	32.5	0.15	292.3	25.2	0.085	54174	1923
1200	8.2	33.6	0.16	301.7	25.4	0.085	54096	1920
1300	8.1	33.8	0.16	357.4	25.3	0.086M	63690M	2233
1400	8.2	36.2	0.17	323.5	26.3	0.088	53826	1910
1500	8.2	36.4	0.17	324.3	27	0.091	53670	1905
1600	8.2	32.7	0.15	292.5	27.6	0.093M	53892M	1913
1700	7.6	31.6	0.16	256.7	25.6	0.093M	48936M	1610
1800	0	0	0	0	0	0.000M	0M	0
1900	0	0	0	0	0	0	0	0
2000	0	0	0	0	0	0	0	0
2100	0	0	0	0	0	0	0	0
2200	0	0	0	0	0	0	0	0
2300	0	0	0	0	0	0	0	0
2400	0	0	0	0	0	0	0	0
AVRGE	5.8	26.8	0.126	241.3	18.1	0.061	38347	1353

Daily SO2 2.9 Tons
Daily CO2 4275.3 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error

D-2 FUEL BLEND CEMS STACK TEST LOGS

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Polk Station
HRSG
Tampa

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Today's Date: 05/11/2000 Reporting Period
Time: 05:11:32 Day: 04/24/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
100	7.8	32.3	0.16	0	31.3	0.111C	0C	0
200	7.9	37.6	0.18	0	31.1	0.109C	0C	0
300	7.9	38.7	0.19	0	31.6	0.110C	0C	0
400	7.9	38.8	0.19	0	31.3	0.109C	0C	0
500	7.9	39.8	0.19	0	31	0.108C	0C	0
600	7.9	39	0.19	0	31.1	0.109C	0C	0
700	7.9	24.9	0.12	0	30.6	0.107C	0C	0
800	7.9	22.6	0.11	0	30.8	0.108C	0C	0
900	8	22.9	0.11	0	31.1	0.107C	0C	0
1000	7.9	24	0.12	0	31.5	0.110C	0C	0
1100	7.9	26.5	0.13	0	31.5	0.110C	0C	0
1200	7.9	27.5	0.13	0	29.9	0.104C	0C	0
1300	7.8	28	0.14	0	29.2	0.103C	0C	0
1400	7.9	27.7	0.13	0	28.5	0.100C	0C	0
1500	7.9	28	0.14	0	27.1	0.095C	0C	0
1600	7.9	27.9	0.14	0	26.2	0.091C	0C	0
1700	7.9	27.3	0.13	0	25.9	0.090C	0C	0
1800	7.9	27.8	0.13	0	25.7	0.090C	0C	0
1900	7.9	27.4	0.13	0	25.5	0.089C	0C	0
2000	7.9	28	0.14	0	25.6	0.089C	0C	0
2100	7.9	29.9	0.15	0	25.1	0.088C	0C	0
2200	7.9	30.9	0.15	0	24.8	0.087C	0C	0
2300	7.9	29.4	0.14	0	25.3	0.088C	0C	0
2400	7.9	29.8	0.14	0	25.5	0.089C	0C	0
AVRGE	7.9	29.9	0.145	0	28.6	0.1	0	0

Daily SO2 0.0 Tons
Daily CO2 0.0 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error

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Polk Station
HRSG
Tampa

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Today's Date: 05/11/2000 Reporting Period
Time: 05:11:48 Day: 04/25/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
100	7.9	30.6	0.15	0	25	0.087C	0C	0
200	7.9	32.6	0.16	0	24.8	0.087C	0C	0
300	7.9	34.2	0.17	0	24.4	0.085C	0C	0
400	8	37.3	0.18	0	23.9	0.082C	0C	0
500	8	43.7	0.21	0	23	0.079C	0C	0
600	8	49.7	0.24	0	22.7	0.078C	0C	0
700	7.9A	40.0A	0.19	0	21.6A	0.075C	0C	0
800	7.9	32.8	0.16	0	23.1	0.081C	0C	0
900	7.9	29.9	0.15	0	24.3	0.085C	0C	0
1000	7.9	30	0.15	0	24.2	0.084C	0C	0
1100	7.9	29.8	0.14	0	24.7	0.086C	0C	0
1200	7.9	29	0.14	0	25.3	0.088C	0C	0
1300	7.9	28.5	0.14	0	25.5	0.089C	0C	0
1400	7.9	28.7	0.14	0	26.1	0.091C	0C	0
1500	7.9	29.1	0.14	0	26.2	0.091C	0C	0
1600	7.9	29.4	0.14	0	26.3	0.092C	0C	0
1700	7.8	29.6	0.15	0	26.2	0.093C	0C	0
1800	7.8	29.5	0.15	0	26.1	0.092C	0C	0
1900	7.8	29	0.14	0	26	0.092C	0C	0
2000	7.7	26.8	0.13	0	25.6	0.092C	0C	0
2100	7.7	26.4	0.13	0	25.3	0.091C	0C	0
2200	7.7	26.9	0.13	0	25	0.090C	0C	0
2300	7.7	28.6	0.14	0	24.9	0.089C	0C	0
2400	7.7	29	0.14	0	25	0.090C	0C	0
AVRGE	7.9	31.7	0.155	0	24.8	0.087	0	0

Daily SO2 0.0 Tons
Daily CO2 0.0 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error

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Polk Station
HRSG
Tampa

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Today's Date: 05/11/2000 Reporting Period
Time: 05:12:13 Day: 04/26/2000

DAILY EPA CEM SUMMARY

Time	CO2	SO2	SO2	SO2	NOX	NOX	FLOW	Ht Inp
	%	ppm	lb/mmBtu	lb/hr	ppm	lb/mmBtu	kscfh	mmBtu
100	7.7	29.6	0.15	0	24.7	0.088C	0C	0
200	7.7	29.9	0.15	0	25.2	0.090C	0C	0
300	7.7	30.4	0.15	0	25.4	0.091C	0C	0
400	7.7	30.4	0.15	0	25.2	0.090C	0C	0
500	7.7	30.2	0.15	0	25.3	0.091C	0C	0
600	7.7	29.7	0.15	0	25.1	0.090C	0C	0
700	7.6	27.6	0.14	0	24.5	0.089C	0C	0
800	7.7	25.1	0.12	0	24.5	0.088C	0C	0
900	7.7	23	0.11	0	24.6	0.088C	0C	0
1000	7.7	21	0.1	0	24.7	0.088C	0C	0
1100	7.7	21.3	0.11	0	24.4	0.087C	0C	0
1200	7.7	22	0.11	0	24.8	0.089C	0C	0
1300	7.7	22.9	0.11	0	24.8	0.089C	0C	0
1400	7.7	24.1	0.12	0	24.8	0.089C	0C	0
1500	7.8	24.3	0.12	0	25.2	0.089C	0C	0
1600	7.8	24.2	0.12	0	25.3	0.089C	0C	0
1700	7.8	24.2	0.12	0	25.2	0.089C	0C	0
1800	7.8	23.8	0.12	0	24.9	0.088C	0C	0
1900	7.7	23.5	0.12	0	24.8	0.089C	0C	0
2000	7.7	22.7	0.11	0	24.5	0.088C	0C	0
2100	7.7	20.7	0.1	0	23.9	0.086C	0C	0
2200	7.7	22.3	0.11	0	24.1	0.086C	0C	0
2300	7.7	24.7	0.12	0	24.1	0.086C	0C	0
2400	7.7	26.6	0.13	0	24	0.086C	0C	0
AVRGE	7.7	25.2	0.125	0	24.8	0.088	0	0

Daily SO2 0.0 Tons
Daily CO2 0.0 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error

D-3 CONTINUOUS EMISSIONS RELATIVE ACCURACY TEST AUDIT RESULTS - 1999

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

SUBJECT: Continuous Emissions Monitoring (CEM) Systems
Relative Accuracy Test Audit Results

TO: David Knapp

FROM: Robert Barthelette Jr.

DATE: 27, October, 1999

Corporate Environmental Services, Air Services Group, performed a Relative Accuracy Test Audit (RATA) on combustion turbine HRSG CEMS (001) September 7 through September 9 , 1999. This audit was conducted in accordance with the system supplier's directions, and meet the requirements of 40 CFR 75, Appendix B.

All results were deemed acceptable, meeting the performance specifications of 40 CFR 75, Appendix A, Performance Specification 3.31, 3.32, 3.33, & 3.34.

Attached to this memorandum, you will find data summary sheets for each system tested. All testing was performed under my direction, and the results are certified as true and accurate.

These records should be maintained at your facility for a period of three (3) years to comply with 40 CFR 75, Appendix F, Record Keeping Requirements. Corporate Environmental Services will maintain all supporting information for this test for the same time period.

Should you have any questions regarding this information, feel free to contact me at extension 38227.

Robert A. Barthelette Jr.
Technician
Corporate Environmental Services
Air Services

cc: J. Nail
J. Woodlee
D. Coleman
D. Smith

SHAREDATA/AIR&WASTE/CEMS/RATA/RATA99/MEMOS

TECO
TAMPA ELECTRIC

RELATIVE ACCURACY TEST AUDIT
DATA SUMMARY

Plant: POLK POWER STATION
Unit: HRSG PRIMARY
Plant ORIS Code: 7242
Boiler or Stack ID: #1
Test Date: 09/7&9/99

Run Number	Start Time	End Time	RM - 6C SO2 ppm	CEM SO2 ppm	Difference ppm	RM - 7E/3A NOx lbs/Mmbtu	CEM NOx lbs/Mmbtu	Difference lbs/MMBtu	RM- 3A CO2 %	CEM CO2 %	Difference %	Run Flag
1	1847	1908	12.600	12.481	0.119	0.078	0.074	0.004	7.640	8.262	-0.622	1
2	1937	1958	13.200	13.096	0.104	0.075	0.073	0.002	7.740	8.354	-0.614	1
3	2014	2035	13.700	12.838	0.862	0.077	0.073	0.004	7.900	8.366	-0.466	0
4	2104	2125	13.800	12.714	1.086	0.076	0.073	0.003	7.890	8.399	-0.509	0
5	0719	0740	9.300	8.877	0.423	0.08	0.078	0.002	7.890	8.201	-0.311	1
6	0819	0840	9.600	8.654	0.946	0.08	0.079	0.001	7.900	8.207	-0.307	0
7	0915	0936	9.500	8.698	0.802	0.083	0.082	0.001	7.860	8.135	-0.275	1
8	1001	1022	8.700	9.117	-0.417	0.081	0.083	-0.002	7.770	8.136	-0.366	1
9	1048	1109	8.500	8.935	-0.435	0.083	0.086	-0.003	7.790	8.064	-0.274	1
10	1130	1151	8.700	9.008	-0.308	0.085	0.086	-0.001	7.630	8.072	-0.442	1
11	1209	1230	8.2	8.724	-0.524	0.084	0.087	-0.003	7.760	8.074	-0.314	1
12	1255	1316	8.1	8.492	-0.392	0.083	0.087	-0.004	7.810	8.021	-0.211	1
Means of Accepted:			9.644	9.714	-0.070	0.081	0.082	0.000	7.766	8.147	-0.381	
Standard Deviations (n-1) of Differences:					0.460			0.003			0.149	

SO2 Confidence Coefficient:		0.353
SO2 Relative Accuracy:	4.35	
SO2 Bias Test:	Passed	
SO2 Bias Adjustment Factor:		1.000
NOx Confidence Coefficient:		0.002
NOx Relative Accuracy:	3.16	
NOx Bias Test:	Passed	
NOx Bias Adjustment Factor:		1.000
CO2 Confidence Coefficient:		0.114
CO2 Relative Accuracy:		6.08

Number of Valid Runs:	9
T-value:	2.306

CEM RACK

SO2 Analyzer S/N:	43B-48910-282
NOx Analyzer S/N:	42D-53124-294
CO2 Analyzer S/N:	EN-029

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

SUBJECT: Continuous Emissions Monitoring (CEM) Systems
Relative Accuracy Test Audit Results

TO: David Knapp

FROM: Robert Barthelette Jr.

DATE: 16, December 1999

Corporate Environmental Services, Air Services Group, performed a Relative Accuracy Test Audit (RATA) on combustion turbine HRSG CEMS (001) on November 8 through November 16, 1999. These audits were conducted in accordance with the system supplier's directions, and meet the requirements of 40 CFR 75, Appendix B.

All results were deemed acceptable, meeting the performance specifications of 40 CFR 75, Appendix A, Performance Specification 3.34.

Attached to this memorandum, you will find data summary sheets for each system tested. All testing was performed under my direction, and the results are certified as true and accurate.

These records should be maintained at your facility for a period of three (3) years to comply with 40 CFR 75, Appendix F, Record Keeping Requirements. Corporate Environmental Services will maintain all supporting information for this test for the same time period.

Should you have any questions regarding this information, feel free to contact me at extension 38227.

Robert A. Barthelette Jr.
Technician
Corporate Environmental Services
Air Services

cc: J. Nail
J. Woodlee
D. Coleman
D. Smith

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: 1
Date: 11/16/99
Load: HIGH,192MW

			Reference Method Data	Source Data		Difference
Run #	Start Time	End Time	Flow Rate (scfh)	Unit Load	CEMS Flow Rate (scfh)	CEMS Flow Rate (scfh)
1	12:07	12:21	49548678.000	191.104	53104560.000	-3555882.000
2	12:22	12:33	49451007.000	191.306	49797120.000	-346113.000
3	12:34	12:44	49640552.000	191.084	51307380.000	-1666828.000
4	12:45	12:56	50082886.000	191.173	52852980.000	-2770094.000
5	12:57	13:10	49720685.000	191.222	51809940.000	-2089255.000
6	13:12	13:24	49747758.000	191.189	51581820.000	-1834062.000
7	13:24	13:34	49679427.000	191.218	51745140.000	-2065713.000
8	13:36	13:47	49949132.000	191.314	52079700.000	-2130568.000
9	13:48	13:58	49822211.000	191.176	53990940.000	-4168729.000
* 10	0:00	0:00				
* 11	0:00	0:00				
* 12	0:00	0:00				
Arithmetic Mean:			49738037.333	191.198	52029953.333	-2291916.000
			R_{ref}=	2.601	Standard Deviation:	1109812.954
					Confidence Coefficient:	853076.224
					Relative Accuracy (%):	**6.32**
					Bias Adjustment Factor:	**1.000**
					T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: 1
Date: 11/11/99
Load: MID,180

Run #	Start Time	End Time	Reference Method Data: Flow Rate (scfh)	Source Data: CEMS Flow Rate (scfh)	Difference: CEMS Flow Rate (scfh)
1	14:55	15:12	47000135.000	49091460.000	-2091325.000
2	15:17	15:29	46830213.000	49268160.000	-2437947.000
3	15:30	15:42	47483042.000	48638220.000	-1155178.000
4	15:44	15:56	47688787.000	49946340.000	-2257553.000
5	15:58	16:10	47403358.000	49539660.000	-2136302.000
6	16:14	16:24	47520527.000	49007520.000	-1486993.000
7	16:26	16:35	47786355.000	50421060.000	-2634705.000
8	16:36	16:45	48080908.000	50286960.000	-2206052.000
9	16:47	16:56	47565053.000	48331080.000	-766027.000
* 10	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 11	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 12	0:00	0:00	#DIV/0!	0.000	#DIV/0!
Arithmetic Mean:			47484264.222	49392273.333	-1908009.111
				Standard Deviation:	627872.033
				Confidence Coefficient:	482624.303
				Relative Accuracy (%):	**5.03**
				Bias Adjustment Factor:	**1.000**
				T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: 1
Date: 11/16/99
Load: LOW,165 MW

			Reference Method Data	Source Data	Difference
Run #	Start Time	End Time	Flow Rate (scfh)	CEMS Flow Rate (scfh)	CEMS Flow Rate (scfh)
1	8:27	8:39	46397799.000	48139560.000	-1741761.000
2	8:40	8:50	46610216.000	47565840.000	-955624.000
3	8:52	9:03	46598399.000	45584400.000	1013999.000
4	9:17	9:29	46147705.000	47698500.000	-1550795.000
5	9:30	9:41	46117811.000	47575020.000	-1457209.000
6	9:42	9:52	46076884.000	47006340.000	-929456.000
7	10:00	10:10	46027076.000	46789980.000	-762904.000
8	10:11	10:23	46604078.000	46296480.000	307598.000
9	10:24	10:35	46240982.000	48306300.000	-2065318.000
* 10	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 11	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 12	0:00	0:00	#DIV/0!	0.000	#DIV/0!
Arithmetic Mean:			46313438.889	47218046.667	-904607.778
				Standard Deviation:	996543.692
				Confidence Coefficient:	766009.918
				Relative Accuracy (%):	**3.61**
				Bias Adjustment Factor:	**1.000**
				T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

D-4 CONTINUOUS EMISSIONS QUALITY ASSURANCE LINEARITY CHECKS - QUARTER 1, 2000

Polk Station

HRSG Start Time:_____ Date:________ End Time:_____ Date:________

Analyzer SO2	LOW	MID	HIGH
REF GAS VALUE	22.87	55.97	91.36
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	16:33	16:40	16:52
RUN 1	21.60	52.05	88.53
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	17:16	17:24	17:32
RUN 2	24.20	58.03	90.83
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	17:41	17:49	17:57
RUN 3	24.01	57.13	90.80
AVERAGE=SUM/3	23.27	55.74	90.05
% ACCURACY	0.40	0.23	1.31
OUT OF CONTROL	NO	NO	NO
SERIAL NUMBER	ALM 010535	ALM 045236	ALM 049904
EXPIRATION DATE	09/02/2000	03/03/2002	03/03/2002

Analyzer NOX	LOW	MID	HIGH
REF GAS VALUE	24.88	54.03	89.31
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	16:33	16:40	16:52
RUN 1	26.44	58.28	92.38
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	17:16	17:24	17:32
RUN 2	26.07	56.31	89.83
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	17:41	17:49	17:57
RUN 3	25.71	55.80	89.23
AVERAGE=SUM/3	26.07	56.80	90.48
% ACCURACY	1.19	2.77	1.17
OUT OF CONTROL	NO	NO	NO
SERIAL NUMBER	ALM 010535	ALM 045236	ALM 049904
EXPIRATION DATE	09/02/2000	03/03/2002	03/03/2002

Analyzer CO2	LOW	MID	HIGH
REF GAS VALUE	3.46	7.72	12.54
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	16:33	16:40	16:52
RUN 1	3.52	7.67	12.40
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	17:16	17:24	17:32
RUN 2	3.56	7.71	12.41
DATE	03/29/2000	03/29/2000	03/29/2000
TIME	17:41	17:49	17:57
RUN 3	3.59	7.71	12.44
AVERAGE=SUM/3	3.56	7.70	12.42
% ACCURACY	0.10	0.02	0.96
OUT OF CONTROL	NO	NO	NO
SERIAL NUMBER	ALM 010535	ALM 045236	ALM 049904
EXPIRATION DATE	09/02/2000	03/03/2002	03/03/2002

APPENDIX E

FUEL ANALYSIS

E-1 BASELINE COMPOSITE

E-2 FUEL BLEND COMPOSITES

E-1 BASELINE COMPOSITE

TECO TAMPA ELECTRIC
Corporate Environmental
Laboratory Services

5012 Causeway Blvd * Tampa, Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

John McDaniel
Martin Duff, Fuels

Report Date: 5/11/00

Laboratory ID: *AA53522*

Location Description:	Polk Power Plant Test Burn	**Sampled By:**	CTE, ST. ROSE
Location Code:	SPECL-PK	**Date Sampled:**	01/27/00
Sample Description:	BASE LINE COAL CAMP COAL	**Time Sampled:**	00:00
		Date Received:	02/08/00

ANALYTICAL RESULTS

Parameter	Results	Units
Ash Fusion, FT, Reducing	2230	Degrees F
Ash Fusion, HT, Reducing	2050	Degrees F
Ash Fusion, IT, Reducing	1960	Degrees F
Ash Fusion, ST, Reducing	2000	Degrees F
Ash, as Received	8.97	%
Ash, Dry Basis	10.3	%
BTU, as Received	11313	BTU/Lb
BTU, Dry Basis	12988	BTU/Lb.
BTU, Moisture-Ash Free	14479	BTU/Lb.
Calcium Oxide, CaO	5.49	%
Carbon, as Received	63.16	%
Carbon, Dry Basis	72.51	%
Chlorine , as Received	0.10	%
Chlorine , Dry Basis	0.12	%
Fixed Carbon, as Received	44.12	%
Fixed Carbon, Dry Basis	50.65	%
Hardgrove Grindability Index	54	HGI
Hydrogen, as Received	4.33	%

5012 Causeway Blvd * Tampa, Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

Parameter	Results	Units
Aluminum Oxide, Al2O3	18.07	%
Hydrogen, Dry Basis	4.97	%
Iron Oxide, Fe2O3	19.28	%
Magnesium Oxide, MgO	1.00	%
Nitrogen, as Received	1.39	%
Nitrogen, Dry Basis	1.60	%
Oxygen, as Received	6.27	%
Oxygen, Dry Basis	7.19	%
Phosphorus, P2O5	0.09	%
Potassium Oxide, K2O	2.40	%
Pounds SO2 / Million BTU	4.84	Lbs. SO2/MMBTU
Silica Value	66.3	%
Silicon Dioxide, SiO2	50.79	%
Sodium Oxide, Na2O	0.81	%
Sulfur in Ash	1.56	%
Sulfur Trioxide, SO3	3.90	%
Sulfur, as Received	2.88	%
Sulfur, Dry Basis	3.31	%
Titanium Dioxide, TiO2	1.00	%
Total Moisture	12.9	%
Volatiles, as Received	34.01	%
Volatiles, Dry Basis	39.05	%

Comments:

Robert L. Dorey
Supervisor of Laboratory Services

E-2 FUEL BLEND COMPOSITES

TECO TAMPA ELECTRIC
Corporate Environmental Laboratory Services

5012 Causeway Blvd * Tampa, Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

John McDaniel, Polk
Martin Duff, Fuels

Report Date: 5/11/00

Laboratory ID: *AA54434*

Location Description: Polk Power Plant
Location Code: SPECL-PK
Sample Description: PET COKE TEST BURN AT POLK

Sampled By: CTE, ST. ROSE
Date Sampled: 04/13/00
Time Sampled: 00:00
Date Received: 04/14/00

ANALYTICAL RESULTS

Parameter	Results	Units
Ash Fusion, FT, Reducing	2390	Degrees F
Ash Fusion, HT, Reducing	2340	Degrees F
Ash Fusion, IT, Reducing	2270	Degrees F
Ash Fusion, ST, Reducing	2290	Degrees F
Ash, as Received	3.90	%
Ash, Dry Basis	4.19	%
BTU, as Received	13535	BTU/Lb
BTU, Dry Basis	14551	BTU/Lb.
BTU, Moisture-Ash Free	15187	BTU/Lb.
Calcium Oxide, CaO	6.10	%
Carbon, as Received	77.51	%
Carbon, Dry Basis	83.33	%
Chlorine , as Received	0.08	%
Chlorine , Dry Basis	0.09	%
Fixed Carbon, as Received	67.17	%
Fixed Carbon, Dry Basis	72.21	%
Hardgrove Grindability Index	55	HGI

Corporate Environmental
Laboratory Services

TAMPA ELECTRIC

5012 Causeway Blvd * Tampa, Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

Parameter	Results	Units
Aluminum Oxide, Al203	21.87	%
Hydrogen, as Received	4.14	%
Hydrogen, Dry Basis	4.45	%
Iron Oxide, Fe2O3	12.73	%
Magnesium Oxide, MgO	0.97	%
Nitrogen, as Received	1.82	%
Nitrogen, Dry Basis	1.96	%
Oxygen, as Received	2.69	%
Oxygen, Dry Basis	2.88	%
Phosphorus, P2O5	0.37	%
Potassium Oxide, K2O	1.41	%
Pounds of Ash / Million BTU	2.877	Lbs./MMBTU
Pounds SO2 / Million BTU	4.05	Lbs. SO2/MMBTU
Silica Value	70.9	%
Silicon Dioxide, SiO2	48.24	%
Sodium Oxide, Na2O	0.93	%
Sulfur in Ash	0.40	%
Sulfur Trioxide, SO3	1.00	%
Sulfur, as Received	2.88	%
Sulfur, Dry Basis	3.10	%
Titanium Dioxide, TiO2	1.10	%
Total Moisture	6.98	%
Volatiles, as Received	21.95	%
Volatiles, Dry Basis	23.6	%

Comments:
CTE, St. Rose Lab #'s 89-1634-15, 16, 17
A weighted composite was made from the three supplied samples.
89-1634-15 = 8308 short tons (hold 1)
89-1634-16 = 8094 short tons (hold 2)

Robert L. Dorey
Supervisor of Laboratory Services

APPENDIX F

FIELD DATA SHEETS

F-1 BASELINE SULFURIC ACID DATA SHEETS

Sulfuric Acid Mist Field Data Form

Plant: Polk Power Station
Location: Unit #1
Date: 2-7-00
Method No.: 8
Run No.: Base-1
Box Operator: RAB / CVC
Probe Operator: RAB / RAM
Time - Start: 10:17 End: 11:25
Sampling Time: 60
Min.\Pt.: 2.5
Meter Box No.: 6
Stack Area Ft³: 283.529
Meter Cal. (ΔH): 1.780
Meter Cal. (ΔY): 0.989

Nozzle I.D. No.: #47 0.201
Nozzle Diameter: 0.201 "
Pitot Tube No.:
Pitot Tube (C_p): 0.84
Probe Length: 14'
Probe Liner Material: Pyrex
Probe Heater Setting: 250
Pressure: Pb ("Hg): 30.05 Pg ("H2O): 0.52 Ps ("Hg): 29.98
Ambient Temperature: 70 °F
Assumed Moisture (%): 7.0
Filter Holder No.:
Comments: Baseline test

Dry Gas Meter Volume
Final: 148.326 Ft³
Initial: 107.402 Ft³
Net: 40.924 Ft³

Equipment Leak Checks
Initial: 0.000 CFM @ 15 "Hg
Final: 0.000 CFM @ 5 "H2O
Pitot Tube: OK @ 6.7 "H2O

Moisture Determination
Impinger: 16 ml
Silica Gel: 24.6 gm
Total: 40.6

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:17	109.2	1.45	1.51	235	336	74	270	63	5
2		111.0	1.45	1.51	235	335	77	267	62	5
3		112.8	1.45	1.51	230	336	78	270	62	5
4		114.4	1.45	1.51	240	335	79	270	62	5
5		116.2	1.45	1.51	239	335	79	270	63	5
6	10:32	117.8	1.25	1.30	237	334	80	267	64	5
1	10:35	119.6	1.45	1.51	235	334	78	267	62	5
2		121.3	1.45	1.51	228	336	80	265	63	5
3		123.1	1.45	1.51	229	336	82	265	64	5
4		124.8	1.45	1.51	228	336	83	266	65	5
5		126.5	1.45	1.51	226	336	84	274	64	5
6	11:00	128.1	1.25	1.30	228	335	85	276	64	5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:52	129.8	1.30	1.36	236	335	84	277	63	5
2		131.5	1.35	1.41	238	336	85	276	63	5
3		133.1	1.35	1.41	238	336	86	276	64	5
4		134.9	1.35	1.41	242	337	87	278	65	5
5		136.5	1.35	1.41	244	336	88	278	65	5
6	11:07	138.1	1.20	1.25	238	334	88	277	65	5
1	11:10	139.8	1.30	1.36	226	335	86	273	64	5
2		141.5	1.35	1.41	227	336	88	275	64	5
3		143.3	1.40	1.46	224	337	89	274	64	5
4		145.0	1.40	1.46	220	338	89	274	64	5
5		146.7	1.40	1.46	219	337	89	271	65	5
6	11:25	148.326	1.30	1.36	217	337	89	276	65	5

Sulfuric Acid Mist Field Data Form

Plant: Polk Power Station
Location: Unit #1
Date: 2-7-00
Method No.: 8
Run No.: Base-2
Box Operator: RHB
Probe Operator: AC/RAM
Time - Start: 13:36 End: 14:42
Sampling Time: 60
Min.\Pt.: 2.5
Meter Box No.: 6
Stack Area Ft³: 283.529
Meter Cal. (ΔH): ~~0.5~~ 1.780
Meter Cal. (ΔY): 0.989

Nozzle I.D. No.: #47
Nozzle Diameter: 0.201
Pitot Tube No.:
Pitot Tube (C_p): 0.84
Probe Length: 14 FT
Probe Liner Material: Pyrex
Probe Heater Setting: 250
Pressure: Pb ("Hg): 30.00 Pg ("H2O): -0.92 Ps ("Hg): 29.93
Ambient Temperature: 75 Windy
Assumed Moisture (%): 7.0
Filter Holder No.:
Comments: Baseline

Dry Gas Meter Volume
Final: 199.456 Ft³
Initial: 157.824 Ft³
Net: 41.136 Ft³

Equipment Leak Checks 15.0 AM
Initial: 0.000 CFM @ ~~4.6~~ "Hg
Final: 0.000 CFM @ 8.0 "H20
Pitot Tube: OK @ 4.6 "H20

Moisture Determination
Impinger: 34 ml
Silica Gel: 15.1 gm
Total: 49.1

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	13:36	159.6	1.35	1.42	180	335	75	263	62	8
2		161.3	1.35	1.42	180	335	78	267	62	7
3		163.0	1.35	1.42	178	335	79	270	57	7
4		164.7	1.40	1.48	182	336	80	268	56	7
5		166.5	1.45	1.53	196	336	81	270	55	8
6	13:51	168.2	1.30	1.37	190	334	81	268	55	7
1	13:53	169.9	1.35	1.42	206	331	80	270	57	7
2		171.6	1.35	1.42	211	336	81	269	55	7
3		173.3	1.35	1.42	216	336	81	270	54	7
4		175.0	1.40	1.48	213	337	82	271	55	7
5		176.8	1.45	1.53	223	336	83	268	56	7
6	14:08	178.5	1.30	1.37	232	335	84	270	56	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	14:10	180.3	1.40	1.48	240	334	84	270	58	7
2		182.0	1.45	1.53	245	336	87	271	57	7
3		183.8	1.45	1.53	241	335	88	274	57	7
4		185.6	1.45	1.53	246	335	89	274	57	7
5		187.3	1.45	1.53	217	334	89	273	58	7
6	14:25	189.0	1.30	1.37	201	333	87	273	59	7
1	14:27	190.8	1.40	1.48	205	333	85	270	59	7
2		192.5	1.45	1.53	210	334	84	268	58	7
3		194.2	1.45	1.53	223	334	85	269	57	7
4		196.0	1.45	1.53	226	335	86	271	58	7
5		197.8	1.45	1.53	234	335	87	271	58	7
6	14:42	199.456	1.30	1.37	232	333	88	269	59	7

Sulfuric Acid Mist Field Data Form

Plant	POLK POWER STATION	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	UNIT #1	Nozzle Diameter	0.201	Final	251.380 Ft³
Date	2-7-00	Pitot Tube No.		Initial	209.725 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.655 Ft³
Run No.	BASE-3	Probe Length	14.0 FT		
Box Operator	RAD	Probe Liner Material	PYREX	Equipment Leak Checks	
Probe Operator	CVC/RAM	Probe Heater Setting	250°F	Initial	0.002 CFM @ 15 "Hg
Time - Start	15:36 End: 16:45	Pressure	Pb ("Hg): 30.00 Pg ("H20): -.92 Ps ("Hg): 29.93	Final	0.000 CFM @ 10 "H20
Sampling Time	60	Ambient Temperature	82	Pitot Tube	OK @ 4.6 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	BASELINE	Impinger	30 ml
Meter Cal. (ΔH)	1.760			Silica Gel	16.8 gm
Meter Cal. (ΔY)	0.989			Total	46.8

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:36	211.5	1.40	1.48	221	333	81	271	63	10
2		213.3	1.45	1.53	196	334	84	267	59	9
3		215.1	1.45	1.53	193	334	85	268	59	9
4		216.9	1.45	1.53	191	334	86	268	59	9
5		218.6	1.45	1.53	201	334	85	270	59	9
6	15:51	220.2	1.30	1.37	198	332	86	270	60	9
1	15:53	222.0	1.45	1.~~48~~53	206	331	84	269	61	9
2		223.8	1.45	1.53	205	332	85	272	59	9
3		225.5	1.45	1.53	200	331	86	272	60	9
4		227.3	1.45	1.53	188	332	86	272	61	9
5		229.0	1.45	1.53	181	332	86	269	61	9
6	16:08	230.7	1.30	1.37	197	331	86	270	62	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	16:12	232.5	1.35	1.42	192	334	81	270	62	9
2		234.2	1.35	1.42	191	334	82	271	60	9
3		235.9	1.35	1.42	189	333	82	271	59	9
4		237.6	1.35	1.42	186	334	82	272	61	9
5		239.3	1.35	1.42	182	334	82	268	61	9
6	16:27	241.1	1.30	1.37	177	333	82	271	62	9
1	16:30	242.7	1.35	1.42	163	332	79	268	62	9
2		244.5	1.35	1.42	160	334	80	266	60	9
3		246.2	1.35	1.42	165	334	80	265	61	9
4		247.9	1.40	1.48	164	334	80	268	61	9
5		249.7	1.40	1.48	161	334	80	267	61	9
6	16:45	251.380	1.30	1.37	161	333	80	269	61	9

Sulfuric Acid Mist Field Data Form

Plant	POLK POWER STATION	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	UNIT #1	Nozzle Diameter	0.201 "	Final	303.408 Ft³
Date	2-7-00	Pitot Tube No.		Initial	261.925 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.483 Ft³
Run No.	BASE-4	Probe Length	14 FT		
Box Operator	RAB	Probe Liner Material	PYREX	Equipment Leak Checks	
Probe Operator	RAM / DAS	Probe Heater Setting	250	Initial	0.000 CFM @ 15 "Hg
Time - Start	17:37 End: 18:45	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.92 Ps ("Hg): 29.88	Final	0.000 CFM @ 8 "H2O
Sampling Time	60	Ambient Temperature	71	Pitot Tube	OK, @ 4.6 "H2O
Min.\ Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	BASELINE	Impinger	31 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20.4 gm
Meter Cal. (ΔY)	0.989			Total	51.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	17:37	263.8	1.35	1.41	160	333	72	260	61	~~10~~ 8
2		265.4	1.35	1.41	164	333	74	264	55	~~10~~ 8
3		267.1	1.35	1.41	165	333	75	268	56	8
4		268.9	1.40	1.46	166	332	76	267	57	8
5		270.6	1.40	1.46	167	331	76	267	58	8
6	17:52	272.2	1.30	1.36	171	330	76	266	58	8
1	17:55	273.9	1.35	1.41	187	330	74	270	58	8
2		275.6	1.35	1.41	194	331	75	271	57	8
3		277.3	1.35	1.41	194	331	75	267	57	8
4		279.0	1.40	1.46	196	331	75	270	58	8
5		280.7	1.35	1.41	197	332	75	267	58	8
6	18:10	282.4	1.30	1.36	195	331	75	268	59	8

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	18:13	284.2	1.40	1.46	180	331	73	268	58	8
2		286.0	1.45	1.51	175	333	73	270	58	8
3		287.7	1.45	1.51	170	333	74	266	59	8
4		289.5	1.45	1.51	169	332	73	267	60	8
5		291.2	1.45	1.51	164	332	73	265	60	8
6	18:28	292.9	1.30	1.36	162	329	73	266	61	7
1	18:30	294.6	1.40	1.46	165	330	71	272	60	8
2		296.2	1.45	1.51	164	332	71	271	59	8
3		298.2	1.45	1.51	164	331	71	268	60	8
4		299.9	1.45	1.51	166	331	71	271	61	8
5		301.7	1.45	1.51	167	330	71	270	61	8
6	18:45	303.408	1.30	1.36	166	329	71	267	62	7

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	353.510 Ft³
Date	2-8-00	Pitot Tube No.		Initial	312.713 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	40.797 Ft³
Run No.	Base-5	Probe Length	14.0 Ft		
Box Operator	RAM / CVC	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	CVC / RAM	Probe Heater Setting	250 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	8:17 End: 9:37	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.90 Ps ("Hg): 29.88	Final	0.000 CFM @ 12 "H2O
Sampling Time	60	Ambient Temperature	58 °F	Pitot Tube	OK @ 7.7 "H2O
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline	Impinger	29 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20.2 gm
Meter Cal. (ΔY)	0.989			Total	49.2

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	8:17	314.4	1.45	1.48	170	336	55	268	50	10
2		316.1	1.45	1.48	169	336	56	268	49	10
3		317.8	1.45	1.48	168	336	57	269	49	10
4		319.5	1.45	1.48	173	336	58	271	50	10
5		321.2	1.45	1.48	174	335	59	269	52	10
6	8:32	322.8	1.30	1.33	174	334	60	273	53	9
1	8:35	~~326.2~~ 324.1	1.45	1.48	188	336	60	268	52	10
2		326.2	1.45	1.48	194	336	60	263	53	10
3		327.8	1.45	1.48	194	336	60	253	54	10
4		329.6	1.45	1.48	202	336	60	256	51	10
5		331.3	1.45	1.48	211	336	62	261	52	10
6	8:58	332.9	1.20	1.22	214	334	63	269	54	8

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP R (In. H_2O)	ΔH o (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	9:03	334.6	1.30	1.33	192	337	62	269	55	10
2		336.3	1.30	1.33	187	337	63	266	54	10
3		337.9	1.30	1.33	183	337	64	266	54	10
4		339.6	1.30	1.33	182	336	64	266	56	10
5		341.4	1.30	1.33	177	336	65	269	57	10
6	9:18	343.0	1.20	1.22	175	334	65	269	58	10
						~~334~~ cvc	~~62~~ cvc	~~269~~ cvc		
1	9:22	~~343.0~~	1.30	1.33	190	334	62	269	56	10
2		344.7	1.30	1.33	196	336	63	271	56	10
3		346.3	1.34	1.37	199	336	64	273	57	~~12~~ 10 cvc
4		348.1	1.34	1.37	199	336	64	273	58	~~12~~ 10 cvc
5		350.0	1.34	1.37	195	336	64	273	59	12
6	9:37	351.9	1.10	1.12	197	334	64	273	59	10
		353.510								

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	404.392 Ft³
Date	2-8-00	Pitot Tube No.		Initial	363.509 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	40.883 Ft³
Run No.	Base-6	Probe Length	14.0 ft		
Box Operator	CVC/RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAB/RAM/CVC	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	10:18 End: 1127	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.90 Ps ("Hg): 29.88	Final	0.000 CFM @ 11 "H20
Sampling Time	60	Ambient Temperature	58°F	Pitot Tube	OK @ 7.7 "H20
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline -6	Impinger	26 ml
Meter Cal. (ΔH)	1.780			Silica Gel	22.3 gm
Meter Cal. (ΔY)	0.989			Total	48.3

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:18	365.3	1.40	1.43	187	336	61	260	55	11
2		367.0	1.30	1.33	190	336	62	259	53	11
3		368.7	1.30	1.33	195	336	63	263	54	10
4		370.4	1.40	1.43	194	336	64	266	55	10
5		372.1	1.40	1.43	199	336	64	270	56	10
6	10:33	373.8	1.30	1.33	198	335	65	273	56	10
1	10:35	375.5	1.30	1.33	179	334	64	274	56	11
2		377.1	1.30	1.33	173	337	65	273	56	11
3		378.7	1.30	1.33	179	337	65	270	57	11
4		380.4	1.30	1.33	180	336	66	273	58	11
5		382.1	1.30	1.33	181	336	66	272	59	10
6	10:50	383.7	1.20	1.22	173	334	67	271	61	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1054	385.4	1.40	1.43	193	335	66	273	60	10
2		387.2	1.40	1.43	198	335	67	273	59	10
3		388.9	1.40	1.43	202	336	68	270	60	10
4		390.6	1.40	1.43	193	335	69	273	61	10
5		392.3	1.40	1.43	193	335	69	269	63	10
6	1109	393.9	1.20	1.22	198	335	69	273	63	9
1	1112	395.7	1.40	1.43	203	336	67	270	62	10
2		397.4	1.40	1.43	199	336	69	269	59	10
3		399.1	1.50	1.53	207	336	70	272	61	11
4		400.9	1.50	1.53	205	336	70	272	61	11
5		402.7	1.50	1.53	209	336	71	271	62	11
6	1127	404.392	1.30	1.33	204	335	72	269	63	10

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	456.063 Ft³
Date	2-8-00	Pitot Tube No.		Initial	415.075 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	40.988 Ft³
Run No.	Base-~~Ex~~ 7	Probe Length	14.0 ft		
Box Operator	CVC/RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAM/RAB/CVC	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start	1216 End: 1324	Pressure	Pb ("Hg): 30.00 Pg ("H2O): -.40 Ps ("Hg): 29.88	Final	0.000 CFM @ 12 "H20
Sampling Time	60	Ambient Temperature	60°F	Pitot Tube	OK @ 7.7 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline - 7	Impinger	26 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20 gm
Meter Cal. (ΔY)	0.989			Total	46

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1216	416.8	1.40	1.46	233	337	73	269	59	11
2		418.5	1.40	1.46	208	337	76	268	57	11
3		420.2	1.40	1.46	209	336	76	269	56	11
4		422.0	1.40	1.46	191	336	76	269	57	11
5		423.7	1.40	1.46	192	336	76	269	57	11
6	1231	425.4	1.30	1.35	201	335	76	270	57	11
1	1233	427.1	1.40	1.46	202	336	75	275	60	12
2		428.9	1.40	1.46	196	336	75	271	59	12
3		430.6	1.40	~~1.42~~ 1.46	203	336	74	270	60	12
4		432.3	1.40	1.46	207	337	74	271	61	12
5		434.1	1.40	1.46	219	336	74	271	61	12
6	1248	435.7	1.20	1.25	226	334	74	273	62	10

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1251	437.4	1.30	1.35	198	336	73	270	64	11
2		439.0	1.20	1.25	203	336	74	271	61	10
3		440.7	1.30	1.35	204	336	74	271	61	11
4		442.4	1.40	1.46	209	336	75	270	63	12
5		444.2	1.40	1.46	210	336	75	269	64	12
6	1306	445.8	1.20	1.25	215	335	75	270	64	10
1	1309	447.5	1.30	1.35	219	336	74	273	66	11
2		449.2	1.30	1.35	220	337	75	269	61	11
3		450.9	1.30	1.35	233	337	75	272	62	11
4		452.6	1.40	1.46	230	337	76	272	62	12
5		454.4	1.40	1.46	238	336	77	269	63	12
6	1324	456.063	1.20	1.25	237	335	77	268	63	10

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit 41	Nozzle Diameter	0.201"	Final	507.654 Ft.³
Date	2-8-00	Pitot Tube No.		Initial	466.368 Ft.³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.286 Ft³
Run No.	Base-8	Probe Length	14.0 ft		
Box Operator	CVC/RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAM/RAB/CVC	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	1404 End: 1512	Pressure	Pb ("Hg): 29.91 Pg ("H2O): -.90 Ps ("Hg): 29.84	Final	0.000 CFM @ 12 "H20
Sampling Time	60	Ambient Temperature	60°F	Pitot Tube	OK @ 7.7 "H20
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline	Impinger	26 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20.4 gm
Meter Cal. (ΔY)	0.989			Total	46.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1404	468.0	1.30	1.35	188	336	74	266	61	10
2		469.7	1.30	1.35	191	337	76	270	58	10
3		471.4	1.40	1.46	201	337	77	271	57	10
4		473.1	1.40	1.46	214	337	78	272	58	11
5		474.9	1.40	1.46	223	336	79	272	60	11
6	1419	476.6	1.30	1.35	224	335	80	270	60	10
1	14:21	478.3	1.30	1.35	218	336	78	269	62	10
2		480.0	1.30	1.35	225	336	79	269	60	10
3		481.6	1.30	1.35	232	336	80	273	60	10
4		483.3	1.35	1.40	225	336	81	271	61	10
5		485.0	1.40	1.46	220	336	81	269	62	11
6	14:36	486.6	1.25	1.30	230	335	82	272	62	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1439	488.3	1.30	1.35	221	335	81	273	65	10
2		490.1	1.40	1.46	222	336	82	274	64	11
3		491.8	1.40	1.46	211	336	82	272	67	11
4		493.5	1.40	1.46	209	336	83	275	67	11
5		495.3	1.40	1.46	213	336	84	271	67	11
6	1454	496.9	1.20	1.25	223	334	84	272	66	10
1	1457	498.8	1.40	1.46	215	337	82	271	65	11
2		500.5	1.40	1.46	213	337	84	274	62	11
3		502.3	1.50	1.56	211	336	84	270	62	12
4		504.2	1.50	1.56	212	336	84	272	63	12
5		505.9	1.50	1.56	223	336	84	270	62	12
6	1512	507.654	1.30	1.35	228	335	85	269	62	10

F-2 BASELINE ORSAT DATA SHEETS

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Pock Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
BASE-1	2-7-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.2	80.2	80.2	80.2	
BASE-2	2-7-00 RAB	CO2	8.2	8.2	8.2	8.2	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
BASE-3	2-7-00 RAB	CO2	8.2	8.2	8.2	8.2	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location POLK POWER STATION

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume) 1	2	3	Avg.	Remarks
BASE 4	2-7-00	CO_2	8.4	8.4	8.4	8.4	
		O_2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N_2	79.8	79.8	79.8	79.8	
		CO_2					
		O_2					
		CO					
		N_2					
		CO_2					
		O_2					
		CO					
		N_2					

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Polk Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
BASE-5	2-8-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
BASE-6	2-8-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
BASE-7	2-8-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.2	80.2	80.2	80.2	

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location POLK POWER STATION

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
BASE-8	2-8-00 RAD	CO2	8.0	8.0	8.0	8.0	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.2	80.2	80.2	80.2	
BASE-9		CO2					
		O2					
		CO					
		N2					
		CO2					
		O2					
		CO					
		N2					

F-3 FUEL BLEND SULFURIC ACID MIST DATA SHEETS

Sulfuric Acid Mist Field Data Form

Plant: Polk Power Station
Location: HRSG
Date: 04-24-2000
Method No.: 8
Run No.: 1
Box Operator: C. Coronado
Probe Operator: J. Werner, D. Smith
Time - Start: 1037 End: 1200
Sampling Time: 60 minutes
Min.\ Pt.: 2.5
Meter Box No.: 6
Stack Area Ft^3: 283.53 ft^2
Meter Cal. (ΔH): 1.756
Meter Cal. (ΔY): 1.001

Nozzle I.D. No.: 47
Nozzle Diameter: 0.201 inches
Pitot Tube No.: 00122
Pitot Tube (C_p): .84
Probe Length: 14
Probe Liner Material: Quartz
Probe Heater Setting: 280
Pressure: Pb ("Hg): 29.5 Pg ("H2O): -.83 Ps ("Hg): 28.9
Ambient Temperature: 74
Assumed Moisture (%): 6.0
Filter Holder No.: 1
Comments:

Dry Gas Meter Volume
Final: 394.899 Ft^3
Initial: 351.179 Ft^3
Net: 43.720 Ft^3

Equipment Leak Checks
Initial: 0.0 CFM @ 15 "Hg
Final: 0.0 CFM @ 6 "H20
Pitot Tube: 0.0 @ 7.0 "H20

Moisture Determination
Impinger: 29 ml
Silica Gel: 20.4 gm
Total: 49.4 ✓

reviewed - [illegible] 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1 2.5	1037	353.0	1.40	cwc ~~1.50~~ 1.51	188	319	74	245	59	5.5
2 5.0		354.8	1.40	cwc ~~1.50~~ 1.51	188	320	75	245	56	5.5
3 7.5		356.6	1.50	1.62	190	320	87	246	57	5.5
4 10.0		358.4	1.60	1.73	187	320	78	246	59	6.0
5 12.5		360.3	1.60	1.73	188	321	78	247	61	6.0
6 15.0	1052	362.1	1.40	cwc ~~1.50~~ 1.51	187	320	79	247	63	6.0
1 2.5	1055	364.0	1.50	1.62	197	321	78	250	66	5.5
2 5.0		365.8	1.40	cwc ~~1.50~~ 1.51	201	321	79	251	65	5.5
3 7.5		367.7	1.50	1.62	199	320	80	250	66	5.5
4 10.0		369.5	1.50	1.62	202	321	80	252	67	5.5
5 12.5		371.4	1.40	cwc ~~1.50~~ 1.51	198	321	81	252	66	5.5
6 15.0	1110	373.1	1.30	1.41	197	319	82	253	66	5.0

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1 2.5	1113	374.9	1.40	1.51	193	321	80	255	65	5.0
2 5.0		376.7	1.30	1.41	188	321	81	256	65	5.0
3 7.5		378.4	1.30	1.41	186	322	82	255	66	5.0
4 10.0		380.3	1.50	1.62	180	322	82	257	66	5.5
5 12.5		382.1	1.40	1.51	180	322	82	255	66	5.0
6 15.0	1128	383.8	1.20	1.30	186	320	82	255	65	5.0
1	1145	385.6	1.40	1.51	185	320	80	257	66	5.0
2		387.5	1.40	1.51	185	321	82	256	63	5.0
3		389.3	1.50	1.62	189	321	82	255	66	5.5
4		391.2	1.50	1.62	188	321	82	255	66	5.5
5		393.1	1.50	1.62	183	322	82	255	67	5.5
6	1200	394,899	1.40	1.51	184	321	82	255	67	5.5

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	47	Dry Gas Meter Volume	
Location	HRSG	Nozzle Diameter	0.201 inches	Final	449.498 Ft³
Date	4-24-2000	Pitot Tube No.	00122	Initial	404.811 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	44.687 ✓ Ft³
Run No.	2	Probe Length	14 ft		
Box Operator	C. Coronado	Probe Liner Material	Quartz	Equipment Leak Checks	
Probe Operator	J. Werner, D. Smith	Probe Heater Setting	600°/450°	Initial	0.0 CFM @ 15 "Hg
Time - Start	1313 End: 1423	Pressure	Pb ("Hg): 29.5 Pg ("H2O): -.83 Ps ("Hg): 28.9	Final	0.0 CFM @ 10 "H2O
Sampling Time	60 min	Ambient Temperature	76	Pitot Tube	0.0 @ 7.0 "H2O
Min.\Pt.	15 min/pt.	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.	2	Moisture Determination	
Stack Area Ft³	283.53 ft²	Comments		Impinger	35 ml
Meter Cal. (ΔH)	1.756			Silica Gel	19.9 gm
Meter Cal. (ΔY)	1.001			Total	54.9 ✓

reviewed - RHM 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1 2.5	1313	406.6	1.40	c/c ~~1.51~~ 1.53	182	320	85	235	65	c/c ~~5~~ 6
2 5.0		408.4	1.40	1.53	177	321	86	236	65	6
3 7.5		410.3	1.60	1.75	180	321	86	241	66	6.5
4 10.0		412.3	1.60	1.75	182	321	86	243	66	6.5
5 12.5		414.2	1.60	1.75	179	322	86	246	66	6.5
6 15.0	1328	416.2	1.30	1.42	177	320	87	247	67	5.5
1	1330	417.9	1.30	1.42	191	322	86	249	68	5.5
2		419.6	1.30	1.42	180	322	87	251	68	5.5
3		421.5	1.40	1.53	172	321	87	254	67	6
4		423.4	1.50	1.64	171	321	87	255	67	6
5		425.2	1.40	1.53	164	321	87	256	67	6
6	1345	427.1	1.30	1.42	164	320	87	257	67	5.5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1 2.5	1350	428.9	1.40	1.53	182	320	86	260	67	6.0
2 5.0		430.8	1.40	1.53	180	320	87	260	66	6.0
3 7.5		432.7	1.50	1.64	179	319	87	260	67	6.0
4 10.0		434.6	1.40	1.53	176	320	87	261	67	6.0
5 12.5		436.5	1.40	1.53	180	320	87	260	68	6.0
6 15.0	1405	438.2	1.20	1.31	179	318	87	259	68	5.0
1	1408	440.1	1.40	1.53	170	320	86	260	67	6.0
2		442.0	1.50	1.64	171	320	87	259	67	6.0
3		443.9	1.50	1.64	172	318	87	258	68	6.0
4		445.8	1.50	1.64	172	318	87	257	68	6.0
5		447.7	1.50	1.64	177	318	87	257	67	6.0
6	1423	449.498	1.30	1.42	185	316	88	257	68	5.5

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	47	Dry Gas Meter Volume	
Location	HRSG	Nozzle Diameter	0.201 inches	Final	505.008 Ft³
Date	04-24-00	Pitot Tube No.	00122	Initial	462.490 Ft³
Method No.	8	Pitot Tube (C_p)	.84	Net	42.518 ✓ Ft³
Run No.	3	Probe Length	14'		
Box Operator	J. Werner	Probe Liner Material	Quartz	Equipment Leak Checks	
Probe Operator	C. Coronado/D. Smith	Probe Heater Setting	280	Initial	0.15 CFM @ 10 "Hg
Time - Start	1630 End: 1855	Pressure	Pb ("Hg): 29.40 Pg ("H20): -.83 Ps ("Hg): 28.9	Final	0.12 CFM @ 10 "H20
Sampling Time	60 min.	Ambient Temperature	84°F	Pitot Tube	0.0 @ 7.5 "H20
Min:\ Pt.	5 min/pt.	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.	3	Moisture Determination	
Stack Area Ft³	283.53 ft²	Comments	STOPPED @ 1705 DUE TO BROKEN LINER	Impinger	24 ml
Meter Cal. (ΔH)	1.756		RESUME TESTING @ 1820	Silica Gel	20.5 gm
Meter Cal. (ΔY)	1.001		(leak check: 0.015 @ 10")	Total	44.5 ✓

reviewed - [initials] 6/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1630		1.5	1.61	172	320	84	222	64	5
2			1.5	1.61	170	322	86	229	62	4
3		467.9	1.6	1.72	169	322	86	237	64	5
4		469.7	1.7	1.83	171	323	85	240	66	5
5		471.6	1.6	1.72	177	322	85	243	67	5
6	1645	473.	1.4	1.51	174	322	86	246	66	4
1	1700	475.1	1.4	1.51	161	321	85	251	65	4
2		476.7	1.5	1.61	162	320	85	252	65	4
3		478.3	1.4	1.51	160	320	86	254	65	4
4		480.1	1.5	1.61	162	320	86	254	66	4
5		481.8	1.4	1.51	169	320	86	255	65	4
6	1715	483.5	1.2	1.29	164	318	85	256	68	4

484.485

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1820	485.9	1.4	1.51	181	323	83	260	64	4
2		487.7	1.4	1.51	186	323	83	259	62	4
3		489.4	1.4	1.51	190	323	84	258	62	4
4		491.0	1.4	1.51	188	323	85	258	65	4
5		492.7	1.4	1.51	189	321	84	257	64	4
6	1835	494.4	1.2	1.29	184	321	84	257	64	4
1	1840	496.1	1.5	1.61	175	318	83	257	65	4.5
2		497.9	1.5	1.61	172	321	84	256	65	4.5
3		499.63	1.6	1.72	174	321	84	255	65	5.0
4		501.50	1.6	1.72	167	322	84	255	64	5.0
5		503.10	1.6	1.72	162	322	84	255	64	5.0
6	1855	505.008	jaw ~~1.6~~ 1.3	jaw ~~1.72~~ 1.40	162	322	84	255	64	5.0

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit 1 HRSG	Nozzle Diameter	0.201	Final	665.156 Ft.³
Date	4-25-00	Pitot Tube No.	~~RAD~~ ~~G-84~~ 00122	Initial	622.184 Ft.³
Method No.	8	Pitot Tube (C_p)	0.84	Net	42.972 Ft.³
Run No.	6	Probe Length	14.0		
Box Operator	RAD	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	JAW / CUC	Probe Heater Setting	300 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	12:21 End: 14:28	Pressure	Pb ("Hg): 29.60 Pg ("H20): -.97 Ps ("Hg): 29.53	Final	0.000 CFM @ 7 ✓"H20
Sampling Time	60 MIN	Ambient Temperature	85 °F	Pitot Tube	OK @ 4.2 ✓"H20
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0%		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft.³	283.530	Comments		Impinger	34 ml
Meter Cal. (ΔH)	1.756			Silica Gel	19.3 gm
Meter Cal. (ΔY)	1.001			Total	53.3 ✓

reviewed - KJM 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	13:21	624.0	1.40	1.50	191	321	85	256	64	7
2		625.9	1.40	1.50	180	324	86	256	63	7
3		627.7	1.40	1.50	182	323	87	256	62	7
4		629.5	1.40	1.50	188	324	87	256	62	7
5		631.3	1.40	1.50	195	323	88	256	62	7
6	13:36	633.0	1.25	1.34	190	323	88	257	62	6
1	13:38	634.8	1.35	1.45	206	321	87	258	63	7
2		636.6	1.40	1.50	213	322	88	259	63	7
3		638.3	1.40	1.50	213	322	89	258	63	7
4		640.1	1.40	1.50	212	322	89	258	63	7
5		641.9	1.35	1.45	210	321	88	258	63	7
6	13:53	643.6	1.25	1.34	216	322	88	258	63	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	13:55	645.4	1.35	1.45	202	320	87	259	64	7
2		647.3	1.40	1.50	199	324	88	260	64	7
3		649.0	1.40	1.50	195	324	89	260	63	7
4		650.8	1.40	1.50	194	322	89	259	63	7
5		652.7	1.40	1.50	192	322	89	260	63	7
6	14:10	654.4	1.35	1.45	198	321	90	261	63	7
1	14:13	656.2	1.35	1.45	192	321	88	260	64	7
2		658.0	1.40	1.50	195	322	89	260	64	7
3		659.8	1.40	1.50	204	321	89	259	64	7
4		661.6	1.40	1.50	211	321	89	259	64	7
5		663.4	1.40	1.50	209	321	89	259	64	7
6	14:28	665.156	1.25	1.34	205	320	89	259	65	7

Sulfuric Acid Mist Field Data Form

Plant	Rock Powerstation	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1 HRSG	Nozzle Diameter	0.201	Final	717.050 Ft³
Date	4-25-00	Pitot Tube No.	00122	Initial	674.313 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	42.737 Ft³
Run No.	1	Probe Length	14 FT		
Box Operator	RAD	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	CVC / JOW	Probe Heater Setting	300 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	15:04 End: 16:10	Pressure	Pb ("Hg): 29.55 Pg ("H2O): -.97 Ps ("Hg): 29.48	Final	0.000 CFM @ 8 "H20
Sampling Time	60 min	Ambient Temperature	85 °F	Pitot Tube	OK @ 4.6 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0 %	Moisture Determination	
Meter Box No.	6	Filter Holder No.		Impinger	~~24~~ 32 ml
Stack Area Ft²	283.530	Comments		Silica Gel	21.2 gm
Meter Cal. (ΔH)	1.756			Total	53.2
Meter Cal. (ΔY)	1.001				

reviewed - KGM 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:04	676.1	1.35	1.45	207	322	85	265	63	8
2		678.0	1.40	1.50	209	321	86	263	63	8
3		679.8	1.40	1.50	206	321	86	263	62	8
4		681.6	1.40	1.50	206	321	87	262	62	8
5		683.3	1.40	1.50	199	320	88	261	62	8
6	15:19	685.1	1.25	1.34	203	319	88	259	63	7
1	15:21	686.9	1.35	1.45	195	320	88	260	63	8
2		688.7	1.40	1.50	194	321	89	259	63	8
3		690.4	1.40	1.50	190	322	89	258	64	8
4		692.2	1.40	1.50	186	321	89	258	64	8
5		694.0	1.40	1.50	188	321	89	258	64	8
6	15:36	695.7	1.20	1.29	191	320	89	259	64	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:38	699.2	1.35	1.45	203	322	89	256	64	8
2		701.1	1.40	1.50	202	323	89	252	64	8
3		702.9	1.40	1.50	206	321	90	252	65	8
4		~~704.7~~ 703.5 RD	1.40	1.50	210	322	90	251	65	8
5		704.7	1.40	1.50	216	320	91	251	64	8
6	15:53	706.5	1.25	1.34	217	321	91	251	63	RD ~~8~~ 7
1	15:55	708.1	1.35	1.45	214	321	90	251	63	8
2		710.1	1.40	1.50	199	321	90	251	63	8
3		711.8	1.40	1.50	198	322	91	252	63	8
4		713.6	1.40	1.50	195	322	91	252	64	8
5		715.4	1.40	1.50	194	321	91	254	64	8
6	16:10	717.050	1.20	1.29	196	321	91	253	64	7

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1 HRSG	Nozzle Diameter	0.201	Final	768.895 Ft^3
Date	4-25-00	Pitot Tube No.	00122	Initial	726.096 Ft^3
Method No.	8	Pitot Tube (C_p)	~~14.0~~ 0.84	Net	42.799 Ft^3
Run No.	8	Probe Length	14.0		
Box Operator	RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	CVC / JAW	Probe Heater Setting	300 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	17:12 End: 18:17	Pressure	Pb ("Hg): 29.55 Pg ("H20): -.97 Ps ("Hg): 29.48	Final	0.000 CFM @ 8 "H20
Sampling Time	60 min	Ambient Temperature	84 °F	Pitot Tube	OK @ 4.6 "H20
Min.\Pt.	2.5	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft^2	283.530	Comments		Impinger	28 ml
Meter Cal. (ΔH)	1.756			Silica Gel	19.8 gm
Meter Cal. (ΔY)	1.001			Total	47.8

reviewed - RAM 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	17:12	727.9	1.35	1.45	190	323	87	255	64	8
2		729.7	1.40	1.50	197	323	89	254	63	8
3		731.5	1.40	1.50	197	322	90	254	62	8
4		733.3	1.40	1.50	198	322	91	253	62	8
5		735.2	1.40	1.50	195	321	91	254	62	8
6	17:27	736.9	1.20	1.29	191	320	91	254	62	7
1	17:29	738.7	1.35	1.45	200	321	90	255	62	8
2		740.5	1.40	1.50	203	321	90	255	62	8
3		742.2	1.40	1.50	207	322	90	255	63	8
4		743.9	1.40	1.50	207	321	90	254	63	8
5		745.7	1.40	1.50	203	322	90	255	63	8
6	17:44	747.4	1.25	1.34	204	321	90	254	63	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	17:45	749.2	1.35	1.45	197	320	89	254	64	7
2		751.0	1.40	1.50	200	322	89	254	64	8
3		752.8	1.40	1.50	195	321	90	255	64	8
4		754.6	1.40	1.50	204	321	90	255	64	8
5		756.4	1.40	1.50	204	320	90	256	64	8
6	18:00	758.1	1.20	1.29	196	320	90	256	64	7
1	18:02	759.9	1.35	1.45	198	319	89	255	64	7
2		761.7	1.40	1.50	201	322	90	256	64	8
3		763.5	1.40	1.50	196	321	89	256	64	8
4		765.3	1.40	1.50	197	322	89	256	65	8
5		767.1	1.40	1.50	199	322	90	256	65	8
6	18:17	768.895	1.25	1.35	196	321	90	256	65	7

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1 HRSG	Nozzle Diameter	0.201	Final	820.390 Ft³
Date	4-25-00	Pitot Tube No.	00122	Initial	777.624 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	42.766 Ft³
Run No.	9	Probe Length	14.0		
Box Operator	RB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	CVC/JAW	Probe Heater Setting	300 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start 18:49	End: 20:00	Pressure	Pb ("Hg): 29.50 Pg ("H2O): -.97 Ps ("Hg): 29.48	Final	0.000 CFM @ 6 "H2O
Sampling Time	60 min	Ambient Temperature	81°F	Pitot Tube	OK @ 4.6 "H2O
Min.\Pt.	2.5	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft²	283.530	Comments		Impinger	24 ml
Meter Cal. (ΔH)	1.756			Silica Gel	19.1 gm
Meter Cal. (ΔY)	1.001			Total	43.1

reviewed - RAM 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	18:49	779.5	1.35	1.45	217	323	86	260	63	6
2		781.3	1.40	1.50	217	322	86	259	62	6
3		783.3	1.40	1.50	214	322	87	259	63	6
4		784.9	1.40	1.50	206	322	87	258	63	6
5		786.7	1.40	1.50	202	321	88	257	64	6
6	19:04	788.4	1.25	1.35	198	320	88	257	64	5
1	19:06	790.2	1.35	1.45	192	315	87	257	64	5
2		792.0	1.40	1.50	195	323	87	257	64	5
3		793.8	1.40	1.50	194	321	87	256	64	5
4		795.6	1.40	1.50	197	322	87	255	64	5
5		797.4	1.40	1.50	201	322	88	255	64	5
6	19:21	799.2	1.25	1.35	201	320	88	255	64	5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	19:23	800.9	1.30	1.40	208	320	87	250	64	5
2		802.7	1.40	1.50	214	323	88	251	64	5
3		804.5	1.40	1.50	223	323	88	252	64	5
4		806.3	1.40	1.50	221	322	88	253	64	5
5		808.2	1.40	1.50	221	324	88	253	64	5
6	19:38	809.8	1.20	1.29	221	320	87	254	63	5
1	19:40	811.6	1.35	1.45	205	321	85	240	63	5
2		813.4	1.40	1.50	213	322	85	235	63	5
3		815.2	1.40	1.50	215	322	85	231	64	5
4		817.9	1.40	1.50	190	324	84	250	65	5
5		818.8	1.40	1.50	187	326	83	253	64	5
6	~~19:55~~	820.390	1.20	1.29	190	323	83	253	63	5
	20:00									

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Run No. 9

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1 HRSG	Nozzle Diameter	0.201	Final	870.380 Ft³
Date	4-26-00	Pitot Tube No.	00122	Initial	828.117 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	42.263 Ft³
Run No.	10	Probe Length	14.0		
Box Operator	RAD	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	CVC / JAW	Probe Heater Setting	300 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	10:18 End: 11:25	Pressure	Pb ("Hg): 29.65 Pg ("H20): -1.00 Ps ("Hg): 29.58	Final	0.000 CFM @ 7 "H20
Sampling Time	60 min	Ambient Temperature	60 °F	Pitot Tube	OK @ 4.7 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0 %		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft²	283.529	Comments		Impinger	28 ml
Meter Cal. (ΔH)	1.756			Silica Gel	20.6 gm
Meter Cal. (ΔY)	1.001			Total	48.6 ✓

reviewed - KBM 5/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:18	829.9	1.35	1.41	207	325	67	267	62	7
2		831.7	1.40	1.46	209	325	69	268	56	5
3		833.5	1.45	1.51	213	324	70	266	56	5
4		835.3	1.50	1.56	219	325	70	268	57	5
5		837.0 RB	1.50	1.56	219	325	71	267	58	5
6	10:33	838.~~849~~8	1.35	1.41	217	325	71	266	59	5
1	10:36	840.6	1.40	1.46	208	323	71	266	60	5
2		842.3	1.40	1.46	196	324	71	267	60	5
3		844.1	1.40	1.46	193	324	72	264	60	5
4		845.8	1.40	1.46	194	324	72	266	61	5
5		847.5	1.40	1.46	190	325	73	267	61	5
6	10:51	849.2	1.25	1.31	186	323	74	265	62	5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:53	851.0	1.45	1.51	202	323	73	268	63	5
2		852.7	1.~~50~~ 45 mm	1.51	200	325	73	267	63	5
3		854.5	1.45	1.51	203	325	73	266	63	5
4		856.3	1.45	1.51	203	324	74	264	63	5
5		858.0	1.45	1.51	208	324	75	266	63	5
6	11:08	859.7	1.25	1.31	198	323	75	267	63	5
1	11:10	861.5	1.45	1.51	196	323	74	267	63	5
2		863.3	1.45	1.51	190	326	75	267	64	5
3		865.1	1.50	1.57	194	327	76	267	64	6
4		866.9	1.50	1.57	192	326	76	264	63	6
5		868.7	1.50	1.57	193	326	76	264	63	6
6	11:25	870.380	1.25	1.31	190	325	76	266	63	5

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1 HRSG	Nozzle Diameter	0.201	Final	922.498 Ft³
Date	4-26-00	Pitot Tube No.	00122	Initial	879.827 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	42.671 Ft³
Run No.	11	Probe Length	14.0		
Box Operator	RAD	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	CVC/JAW	Probe Heater Setting	300 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	12:02 End: 1308	Pressure	Pb ("Hg): 29.65 Pg ("H2O): -1.00 Ps ("Hg): 29.58	Final	0.000 CFM @ 5 "H2O ✓
Sampling Time	60 min	Ambient Temperature	63 °F	Pitot Tube	OK @ 4.7 "H2O
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0 %		
Meter Box No.	#6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments		Impinger	32 ml
Meter Cal. (ΔH)	1.756			Silica Gel	20.4 gm
Meter Cal. (ΔY)	1.001			Total	52.4 ✓

reviewed - TBM 6/1/2000

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	12:02	881.7	1.45	1.51	205	325	74	266	57	5
2		883.4	1.45	1.51	207	325	76	267	57	5
3		885.2	1.45	1.51	204	325	77	265	57	5
4		887.0	1.50	1.57	205	326	78	268	58	5
5		888.9	1.50	1.57	201	326	79	265	59	5
6	12:17	890.1	1.25	1.31	194	326	79	264	59	5
1	12:19	892.3	1.45	1.51	203	324	77	266	60	5
2		894.1	1.45	1.51	217	325	78	267	60	5
3		895.9	1.45	1.51	211	324	79	265	61	5
4		897.7	1.45	1.51	210	324	80	266	62	5
5		899.4	1.45	1.51	215	325	80	265	62	5
6	12:34	901.1	1.25	1.31	222	323	81	265	63	5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	12:36	902.9	1.40	1.46	216	324	80	267	63	5
2		904.7	1.45	1.51	220	326	81	268	64	5
3		906.5	1.45	1.51	215	326	82	268	64	5
4		908.3	1.45	1.51	208	325	82	269	64	5
5		910.0	1.45	1.51	207	325	82	266	64	5
6	12:51	911.7	1.25	1.31	213	325	83	265	64	5
1	12:53	913.6	1.45	1.51	212	326	82	266	64	5
2		915.3	1.45	1.51	211	325	83	266	64	5
3		917.1	1.45	1.51	215	325	83	264	65	5
4		919.0	1.50	1.57	217	324	84	266	65	5
5		920.8	1.45	1.51	227	324	84	266	65	5
6	13:08	922.498	1.25	1.31	229	323	85	267	65	5

F-4 FUEL BLEND ORSAT DATA SHEETS

ORSAT DATA AND CALCULATION SHEET

Source UNIT 1 HRSG Location ROCK POWER

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume) 1	2	3	Avg.	Remarks
1	4/24/00	CO_2	7.0	6.8	7.0	6.9	Replaced bladder on orsat 001 using bladder from orsat 002
		O_2	13.6	13.8	13.6	13.7	
		CO	0	0	0	0	
		N_2	79.4	79.4	79.4	79.4	$F_o = 1.043$
2	4/24/00	CO_2	7.6	7.6 ~~17.5~~	7.6	7.6	$F_o = 1.039$
		O_2	13.2	13.0	13.0	13.0	
		CO	0	0	0	Ø	
		N_2	79.2	79.4	79.4	79.4	
3	4/24/00	CO_2	7.6	7.6	7.6	7.6	$F_o = 1.[illegible]3$
		O_2	13.4	13.0	13.2	13.2	
		CO	0	0	0	Ø	
		N_2	79.0	79.4	79.2	79.2	

5/1/2000

ORSAT DATA AND CALCULATION SHEET

Source HRSG UNIT 1 Location POLK POWER STATION

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
JAW 6	4/25/00	CO2	8.0	8.1	8.2	8.1	F_o = 0.938
		O2	13.4	13.2	13.2	13.3	
		CO	0	0	0	Ø	
		N2	78.6	78.6	78.6	78.6	
JAW 7	4/25/00	CO2	7.8	7.8	7.6	7.7	F_o = 1.013
		O2	13.0	13.0	13.2	13.1	
		CO	0	0	0	Ø	
		N2	79.2	79.2	79.2	79.2	
JAW 8	4/25/00	CO2	7.8	7.8	7.8	7.8	F_o = 1.013
		O2	13.0	13.0	13.0	13.0	
		CO	0	0	0	Ø	
		N2	79.2	79.2	79.2	79.2	

BAM 5/1/2000

ORSAT DATA AND CALCULATION SHEET

Source HRSG UNIT 1 Location POLK POWER STATION

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
Jaw		CO2	7.8	7.8	7.6	7.7	F_o = 1.026
		O2	13.0	13.0	13.0	13.0	
9	4/25/00	CO	0	0	0	∅	
		N2	79.2	79.2	79.4	79.3	
		CO2					
		O2					
		CO					
		N2					
		CO2					
		O2					
		CO					
		N2					

5/1/2000

ORSAT DATA AND CALCULATION SHEET

Source HRSG UNIT 1 Location POLK POWER STATION

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume) 1	2	3	Avg.	Remarks
10	4/26/00	CO2	7.8	~~11.8~~ 7.8	7.8	7.8	
		O2	11.8	11.6	11.6	11.7	F_0 = 1.179
		CO	0	0	0	∅	
		N2	80.4	80.6	80.6	80.5	
11	4/26/00	CO2	~~11.8~~ 8.0	8.0	8.0	8.0	
		O2	11.6	11.6	11.6	11.6	F_0 = 1.163
		CO	0	0	0	∅	
		N2	80.4	80.4	80.4	80.4	
		CO2					
		O2					
		CO					
		N2					

5/1/2000

APPENDIX G

SAMPLE EQUIPMENT CALIBRATIONS

G-1 BASELINE EQUIPMENT CALIBRATIONS

G-2 FUEL BLEND EQUIPMENT CALIBRATIONS

G-1 BASELINE EQUIPMENT CALIBRATIONS

SUMMARY OF EQUIPMENT CALIBRATIONS

EQUIPMENT	CALIBRATION DATE	LOCATION	METHOD	RESULTS
Method 8 Console 6 Initial Test Post Test	 10-06-99 03-02-00	 CES CES	 Wet Test Meter Wet Test Meter	 Y = 0.989 Y = 0.965
Nozzle #47 Initial Measurement Post Test	 10-04-00 03-03-00	 CES CES	 3 Measurements w/calipers	 DN= 0.201 DN= 0.201
Pyrometer No. 12	1-11-00	CES	Comparison to ASTM Thermometer	Correct to ∀ 2EF
Pitot Tube 00122	1-07-00	CES	EPA Method 2	CP = 0.84
Wet Test Meter Serial No. 12-AH-4	7-01-99	CES	Liquid Displacement	CF= 1.003
Barometer SN 00227	1-04-00	CES	Comparison to National Weather Services	Correct to ∀ 0.01" Hg

INITIAL DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.00 IN. HG.

DATE 06-Oct-99 PERFORMED BY Suk

SYSTEM LEAK CK. 0.000 @ 27 "Hg ORIFICE LEAK CK. OK @ 6.3 " H_2O

	RUN 1	RUN 2	RUN 3	RUN 4
VACUUM ("Hg)	3.0	3.0	3.0	3.0
dHw ("H2O)	0.5	1.1	1.6	2.0
dHd ("H2O)	0.5	1.0	1.5	2.0
INITIAL WTM	0.000	0.000	0.000	0.000
FINAL WTM	5.9595	8.9333	6.7078	7.6529
INITIAL DGM	674.148	680.514	690.009	697.452
FINAL DGM	680.241	689.775	697.048	705.582
TEMP. WTM (F)	71.0	71.0	71.0	71.0
TEMP. DGM (F)	87.0	89.0	90.0	91.0
TEST TIME (MIN.)	15.0	16.0	10.0	10.0

NET VOLUME WTM	5.9595	8.9333	6.7078	7.6529
NET VOLUME DGM	6.093	9.261	7.039	8.130
Y	1.006	0.995	0.983	0.972
dH@	1.725	1.741	1.806	1.847

AVERAGE Y = 0.989

ACCEPTABLE Y RANGE = 0.969 TO 1.009

AVERAGE dH@ = 1.780

ACCEPTABLE dH@ RANGE = 1.630 TO 1.930

Y = (Vw (Pb) x (Td + 460)) / (Vd (Pb + (dHd / 13.6)) x (Tw + 460)

dH@ = 0.0317 x dHd / (Pb (Td + 460)) x ((Tw + 460) x time) / Vw)^2

Reviewed By: RAm

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Date: 11/15/99

RECHECK OF ORIFICE AND DGM CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.10 IN. HG.

DATE 3-2-00 PERFORMED BY BDR

PRIOR Y = 0.989

SYSTEM LEAK CK. 0.000 @ 7" Hg

	RUN 1	RUN 2	RUN 3
VACUUM ("Hg)	7.0	7.0	7.0
dHw ("H2O)	1.05	1.05	1.05
dHd ("H2O)	1.00	1.00	1.00
INITIAL WTM	0.0000	8.3365	16.5600
FINAL WTM	8.3365	16.5600	24.7382
INITIAL DGM	302.780	311.688	320.485
FINAL DGM	311.688	320.485	329.246
TEMP. WTM (F)	70.5	70.5	70.0
TEMP. DGM (F)	88.0	89.0	90.0
TEST TIME (MIN.)	15.0	15.0	15.0

NET VOLUME WTM	8.3365	8.2235	8.1782
NET VOLUME DGM	8.908	8.797	8.761
Y	0.964	0.965	0.966
dH@	1.751	1.796	1.809

PRIOR Y = 0.989
RECHECK Y = 0.965
% DIFFERENCE = -2.427

AVERAGE dH@ = 1.786

$Y = (Vw\ (Pb) \times (Td + 460)) / (Vd\ (Pb + (dHd / 13.6)) \times (Tw + 460)$
$dH@ = 0.0317 \times dHd / (Pb\ (Td + 460)) \times ((Tw + 460) \times time / Vw)^2$

Reviewed By:

Date: 3/13/2000

SHARDATA\AIR SERVICES\CALS\PART\POSTTEST\BOX6\METCAL-H

NOZZLE CALIBRATION DATA FORM

NOZZLE SET NO. 1

DATE: 10/04/99 CALIBRATOR: Bruce D. Rodriguez BDR

NOZZLE I. D.	NOZZLE DIAMETER (IN.) D1	D2	D3	D diff.	D avg
#1	0.110	0.114	0.114	0.004	0.113
#4	0.122	0.122	0.122	0.000	0.112
#5	0.146	0.146	0.150	0.004	0.147
#6	0.197	0.197	0.193	0.004	0.196
#9	0.276	0.276	0.276	0.000	0.276
#10	0.293	0.293	0.293	0.000	0.293
#12	0.386	0.386	0.388	0.002	0.387
#15	0.159	0.159	0.159	0.000	0.159
#16	0.197	0.197	0.197	0.000	0.197
#19	0.278	0.278	0.280	0.002	0.279
#22	0.364	0.366	0.366	0.002	0.365
#30	0.309	0.311	0.311	0.002	0.310
#36	0.185	0.185	0.185	0.000	0.185
#37	0.211	0.211	0.211	0.000	0.211
#38	0.248	0.248	0.248	0.000	0.248
#46	0.189	0.189	0.189	0.000	0.189
#47	0.201	0.201	0.201	0.000	0.201
#48	0.250	0.252	0.250	0.002	0.251
#50	0.311	0.311	0.311	0.000	0.311
#58	0.240	0.240	0.240	0.000	0.240
#68	0.240	0.240	0.242	0.002	0.241

where:

D 1,2,3 = three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

D diff. = maximum difference between any two diameters, (in.) must be .004 in. or less.

D avg. = average of D1, D2, and D3.

REVIEWED BY: KGM
DATE: 11/15/99

h:\shardata\air programs\cals\nozzles\initial\nozcali.wk4

FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO. 47

DATE: 3-3-00

CALIBRATED BY: BDR BDR

NOZZLE IDENTIFICATION	NOZZLE DIAMETER			½D (IN.)	D AVG
	D1 (IN.)	D2 (IN.)	D3 (IN.)		
47	0.201	0.201	0.201	0.000 ERR	0.201 ERR
				ERR ERR	ERR ERR
				ERR ERR	ERR ERR

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

½D= maximum difference between any two diameters,(in.).
½D¥ 0.004 in.

D AVG= average of D1,D2 and D3.

SHARDATA\AIR SERVICES\CALS\NOZZLES\POSTTEST\NOZCALF

Reviewed By: BM
Date: 3/13/2000

PYROMETER CALIBRATION

PYROMETER NO.: 12

REFERENCE THERMOMETER: ASTM 2-F

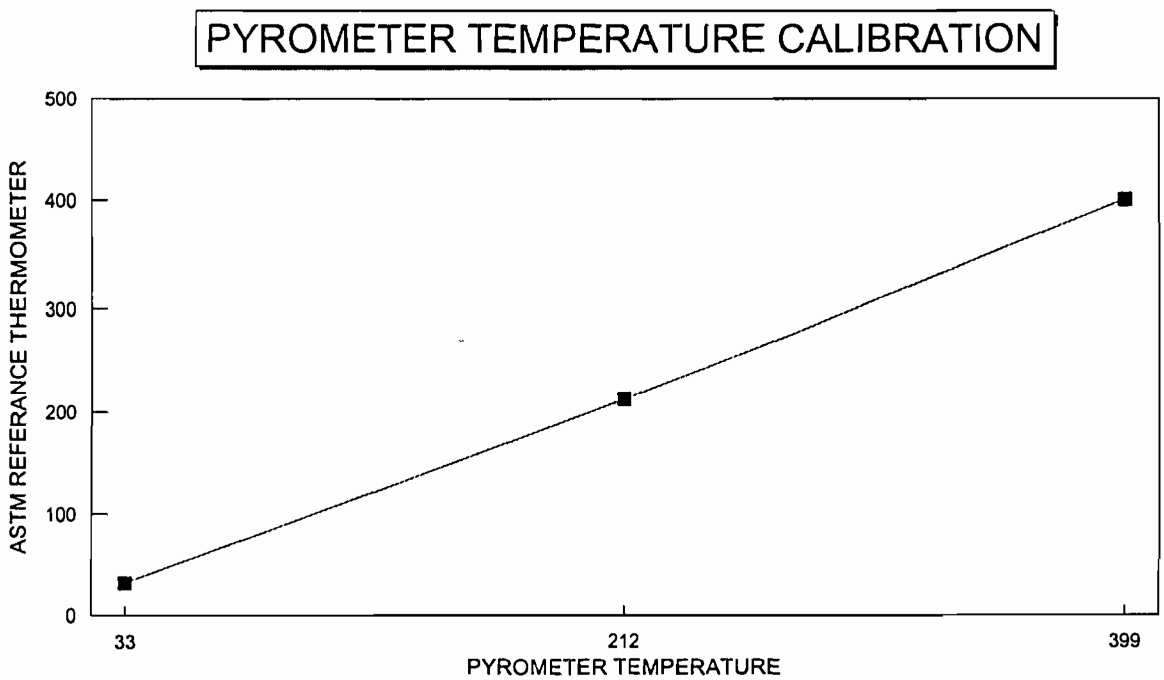
CTL SERIAL NO.: 12

SERIAL NO.: L98-213

DATE: 1-11-00

CALIBRATOR: [signature]

REFERENCE TEMP. (F)	PYROMETER INDICATION
32	33
212	212
400	399



REVIEWED BY: [signature]

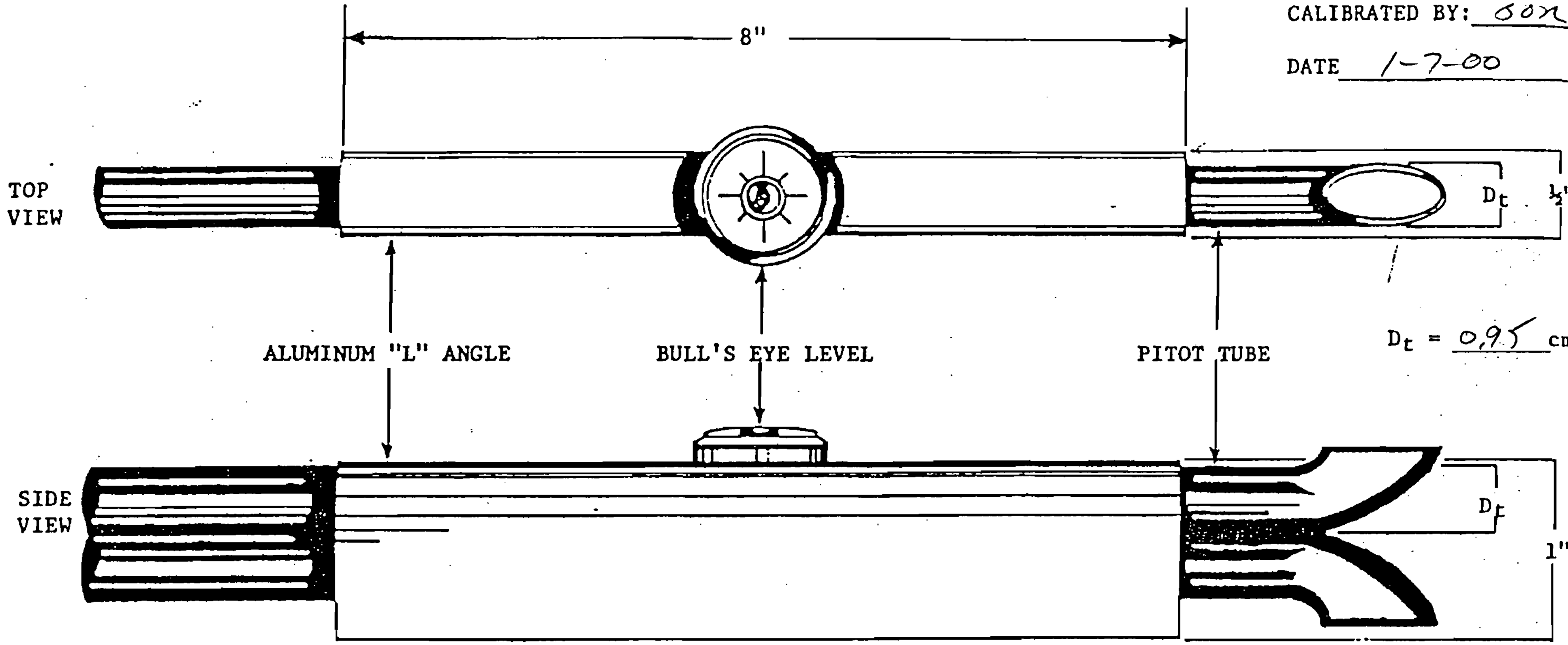
DATE: 2/21/00

shardata\airservices\cals\pyros\pyro#12

SERIAL NO. 00122

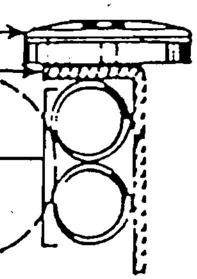
CALIBRATED BY: OON

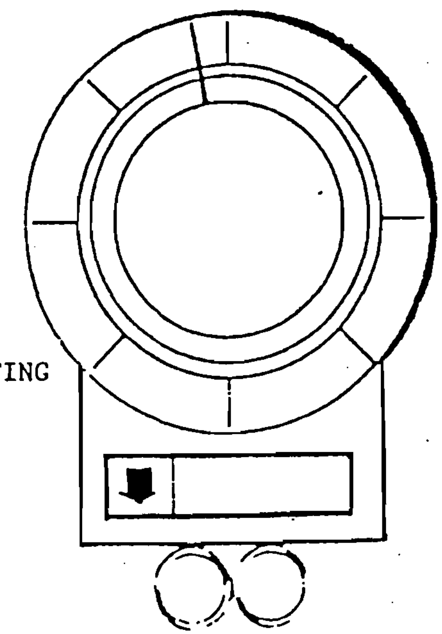
DATE 1-7-00



D_t = 0.95 cm.

END VIEW





PITOT TUBE OPENINGS DAMAGED? no

COMMENTS: ______________________

____

____

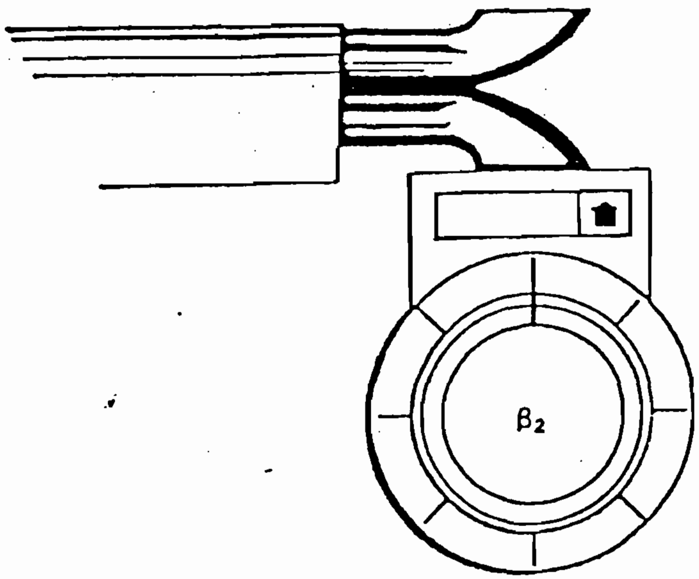
Reviewed By: RAM
Date: 2/21/00

PITOT TUBE CALIBRATION SET-UP POSITION

SERIAL NO. 00122

CALIBRATED BY BOA

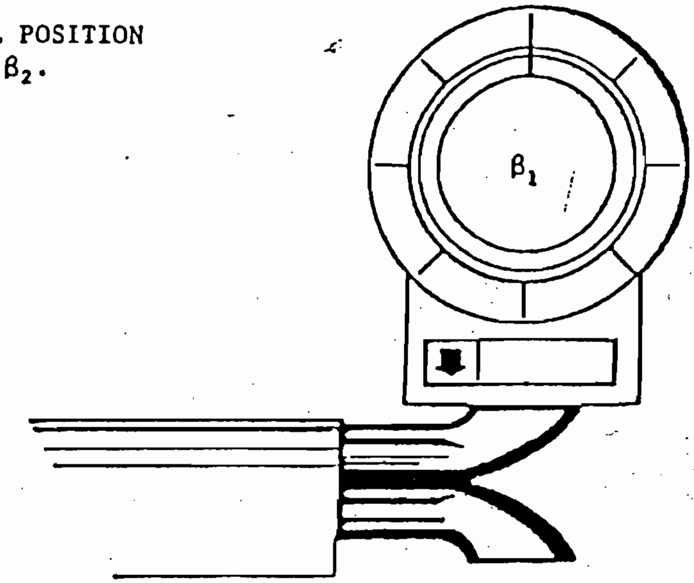
DATE 1-7-00

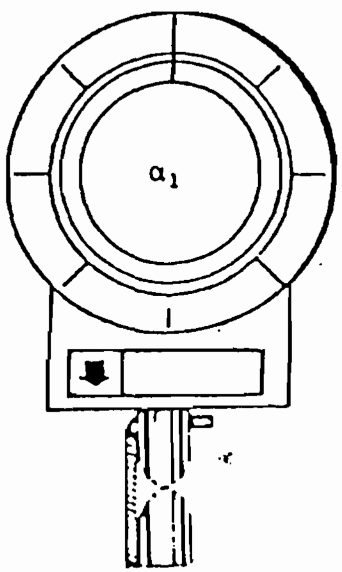


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 0.5 °(<5°)

β_2 = 0.2 °(<5°)

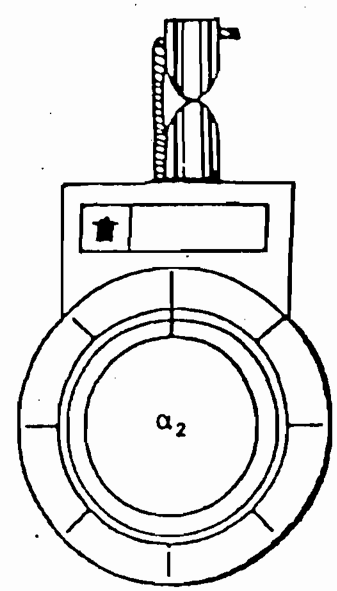




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 0.4 °(<10°)

α_2 = 0.4 °(<10°)



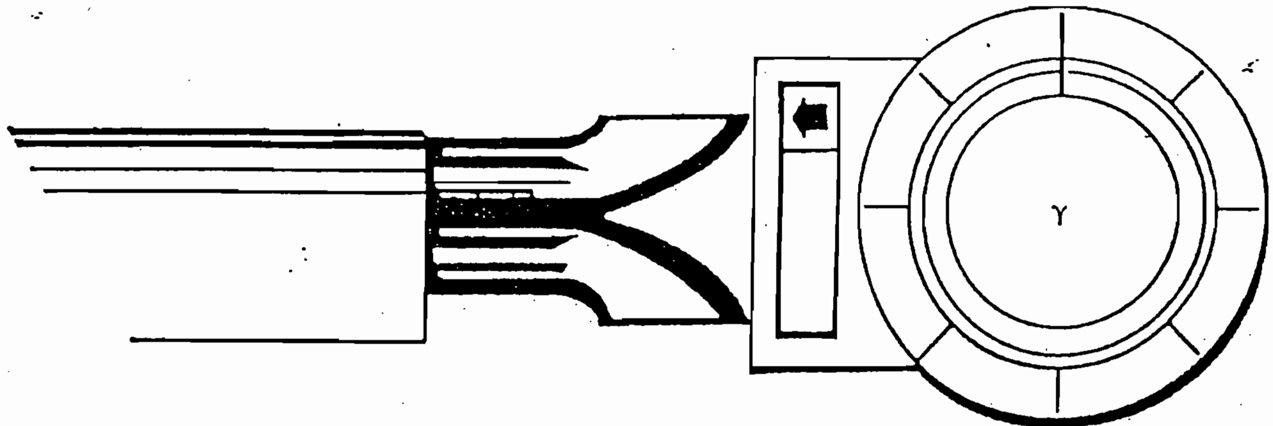
PITOT TUBE CALIBRATION; α and β DETERMINATION

Reviewed By: [illegible]
Date: 2/21/00

SERIAL NO. 00122

CALIBRATED BY Jon

DATE 1-7-00

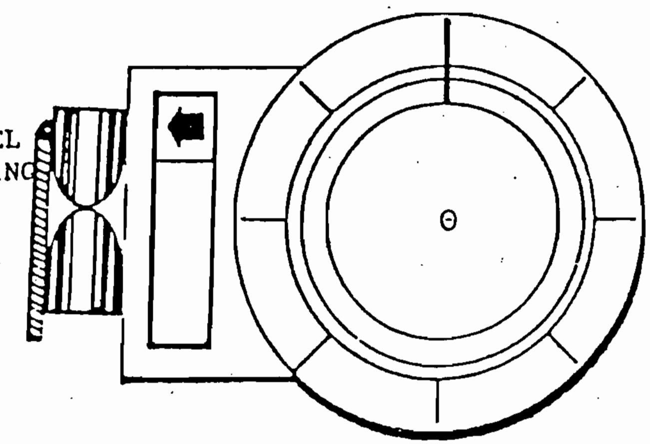


DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

γ = 0,9 °

A = DISTANCE BETWEEN TIPS, ($P_a + P_b$), cm. = ~~0,9~~ 2,360 cm.

Z = A sin γ = 0,037 cm; (<0.32 cm).



DEGREE INDICATING LEVEL
POSITION FOR DETERMINING
Θ, THEN CALCULATING W.

Θ = 0,2 °

W = A sin Θ = 0.008 cm; (<0.08 cm).

PITOT TUBE CALIBRATION: A, W, γ, Θ and Z DETERMINATION

Reviewed By: [signature]
Date: 2/21/00

WET TEST METER CALIBRATION DATA FORM

DATE: 07/01/99

NAME: Sub

BAROMETRIC PRESS: 30.09

AMBIENT TEMP: 70.5

WET TEST METER SERIAL NUMBER: 12-AH-4

RUN NUMBER	VOLUME OF WATER DISPLACED (LITERS) Va	INITIAL METER READING (FT3)	FINAL METER READING (FT3)	NET METER VOLUME (FT3)	NET METER VOLUME (LITERS) Vw	ERROR
1	3.3600	0.0000	0.1184	0.1184	3.3531	-0.002053571
2	3.3600	0.1184	0.2372	0.1188	3.3644	0.001309524
3	3.3600	0.2372	0.3555	0.1183	3.3503	-0.002886905
4	3.3600	0.3555	0.4731	0.1176	3.3304	-0.008809524
					AVG. ERROR =	-0.003110119

CALCULATIONS:

CORRECTION FACTOR : 1.003119822

(1.000 + / - 0.010)

ERROR = (Vw - Va) / Va

CORRECTION FACTOR (C.F.) = 1 / (1 + AVERAGE ERROR)

* CONVERSION FACTOR , FT3 TO LITERS = FT3 x 28.32

WHEN USING THE WET TEST METER, THE ACTUAL VOLUME OF AIR CAN BE DETERMINED BY THE EQUATION:

Va = Vw x C.F.

WHERE:

Va = ACTUAL VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

Vw = MEASURED VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

C.F. = CORRECTION FACTOR FOR THE WET TEST METER.

REVIEWED BY: [signature]

DATE: 8/6/99

REVISED 5-9-96

BAROMETER CALIBRATION DATA FORM

DATE: 1-4-00 CALIBRATOR: BDR

INST. NO: 227

COMMENTS:

TIME OF READING	BAROMETER READING (HG")	REFERENCE STANDARD READING (HG")	DIFFERENCE (HG")
1020	30.22	30.16	0.06
1215	30.15	30.14	0.01
1400	30.13	30.13	0.00
			0.00
			0.00
			0.00

*NOTE: BAROMETRIC READINGS MUST AGREE WITHIN 0.1 INCHES HG OF READINGS OBTAINED FROM THE REFERENCE STANDARD, THE NATIONAL WEATHER SERVICE, RUSKIN FL TO BE DEEMED ACCEPTABLE.

REVIEWED BY: TDM
DATE: 2/21/00

SHARDATA\AIR SERVICES\CALS\BAROMETER\00224

REVISED 5-9-96

G-2 FUEL BLEND EQUIPMENT CALIBRATIONS

SUMMARY OF EQUIPMENT CALIBRATIONS

EQUIPMENT	CALIBRATION DATE	LOCATION	METHOD	RESULTS
Method 8 Console 6 Initial Test Post Test	 4-03-00 05-01-00	 CES CES	 Wet Test Meter Wet Test Meter	 Y = 0.986 Y = 0.987
Nozzle #47 Initial Measurement Post Test	 10-04-00 05-01-00	 CES CES	 3 Measurements w/calipers	 DN= 0.201 DN= 0.202
Pyrometer No. 12	4-13-00	CES	Comparison to ASTM Thermometer	Correct to ∀ 2EF
Pitot Tube 00122	4-07-00	CES	EPA Method 2	CP = 0.84
Wet Test Meter Serial No. 12-AH-4	1-04-00	CES	Liquid Displacement	CF= 1.003
Barometer SN 00227	4-13-00	CES	Comparison to National Weather Services	Correct to ∀ 0.01" Hg

SHARDATA\AIR SERVICES\WPSOURCE\POLK\PETCOKE\CALSUM

INITIAL DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.08 IN. HG.

DATE 4-3-00 PERFORMED BY bdr BDR

SYSTEM LEAK CK. 0.000 15" Hg ORIFICE LEAK CK. ok @ 5.8" H2O

	RUN 1	RUN 2	RUN 3	RUN 4
VACUUM ("Hg)	3.0	3.0	3.0	3.0
dHw ("H2O)	0.6	1.1	1.6	2.0
dHd ("H2O)	0.5	1.0	1.5	2.0
INITIAL WTM	0.000	6.118	16.769	23.495
FINAL WTM	6.118	14.500	23.495	31.130
INITIAL DGM	877.242	883.515	894.710	901.885
FINAL DGM	883.515	892.302	901.885	910.136
TEMP. WTM (F)	69.5	69.5	69.5	69.5
TEMP. DGM (F)	86.0	92.0	95.0	97.0
TEST TIME (MIN.)	15.0	15.0	10.0	10.0
NET VOLUME WTM	6.1180	8.3820	6.7260	7.6350
NET VOLUME DGM	6.273	8.787	7.175	8.251
Y	1.004	0.992	0.979	0.969
dH@	1.627	1.714	1.765	1.820

AVERAGE Y = 0.986

ACCEPTABLE Y RANGE = 0.966 TO 1.006

AVERAGE dH@ = 1.731

ACCEPTABLE dH@ RANGE = 1.581 TO 1.881

$Y = (Vw\ (Pb)\ x\ (Td + 460))\ /\ (Vd\ (Pb + (dHd / 13.6))\ x\ (Tw + 460)$

$dH@ = 0.0317\ x\ dHd\ /\ (Pb\ (Td + 460))\ x\ ((Tw + 460)\ x\ time)\ /\ Vw)^{\wedge}2$

Reviewed By: BAM

Date: 5/1/2000

SHARDATA\AIR SERVICES\CALS\PART\INITIAL\BOX6\METCAL-I

RECHECK OF ORIFICE AND DGM CALIBRATION

CONTROL BOX NO.	6	BAROMETRIC PRESS.	30.08	IN. HG.
DATE	5-1-00	PERFORMED BY	RAB / JAW	
		PRIOR Y =	1.001	

SYSTEM LEAK CK. 0.000 @t 10 In Hg

	RUN 1	RUN 2	RUN 3
VACUUM ("Hg)	10.0	10.0	10.0
dHw ("H2O)	1.05	1.05	1.05
dHd ("H2O)	1.00	1.00	0.99
INITIAL WTM	0.0000	8.3992	16.7632
FINAL WTM	8.3992	16.7632	25.1080
INITIAL DGM	217.472	226.187	234.879
FINAL DGM	226.187	234.899	243.567
TEMP. WTM (F)	71.0	70.5	69.5
TEMP. DGM (F)	85.0	86.0	86.0
TEST TIME (MIN.)	15.0	15.0	15.0
NET VOLUME WTM	8.3992	8.3640	8.3448
NET VOLUME DGM	8.715	8.712	8.688
Y	0.987	0.986	0.988
dH@	1.739	1.747	1.731

PRIOR Y = 1.001
RECHECK Y = 0.987
% DIFFERENCE = -1.399

AVERAGE dH@ = 1.739

Y = (Vw (Pb) x (Td + 460)) / (Vd (Pb + (dHd / 13.6)) x(Tw + 460)
dH@ = 0.0317 x dHd / (Pb (Td + 460)) x ((Tw + 460) x time / Vw)^2

Reviewed By: [signature]

SHARDATA\AIR SERVICES\CALS\PART\POSTTEST\BOX6\METCAL-H

Date: 5/2/2000

NOZZLE CALIBRATION DATA FORM

NOZZLE SET NO. 1

DATE: 4-3-00 CALIBRATOR: BDR BDR

NOZZLE I. D.	NOZZLE DIAMETER (IN.) D1	D2	D3	D diff.	D avg
#1	0.114	0.114	0.112	0.002	0.113
#4	0.124	0.124	0.124	0.000	0.124
#5	0.15	0.15	0.15	0.000	0.150
#6	0.193	0.193	0.193	0.000	0.193
#9	0.278	0.278	0.278	0.000	0.278
#10	0.295	0.295	0.295	0.000	0.295
#12	0.395	0.395	0.394	0.001	0.395
#15	0.161	0.161	0.159	0.002	0.160
#16	0.197	0.197	0.197	0.000	0.197
#19	0.280	0.280	0.278	0.002	0.279
#22	0.366	0.366	0.366	0.000	0.366
#30	0.311	0.311	0.311	0.000	0.311
#36	0.187	0.187	0.185	0.002	0.186
#37	0.213	0.213	0.211	0.002	0.212
#38	0.252	0.252	0.252	0.000	0.252
#46	0.193	0.191	0.191	0.002	0.192
#47	0.201	0.201	0.201	0.000	0.201
#48	0.252	0.250	0.252	0.002	0.251
#50	0.311	0.313	0.313	0.002	0.312
#58	0.242	0.240	0.242	0.002	0.241
#68	0.242	0.242	0.242	0.000	0.242

where:

D 1,2,3 = three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

D diff. = maximum difference between any two diameters, (in.) must be .004 in. or less.

D avg. = average of D1, D2, and D3.

REVIEWED BY: BDR
DATE: 5/1/2000

SHARDATA\AIR SERVICES\CALS\NOZZLES\INITIAL\NOZCALI

FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO. 1

DATE: May 01, 2000 CALIBRATED BY: Jim Werner

NOZZLE IDENTIFICATION	NOZZLE DIAMETER			¼D (IN.)	D AVG
	D1 (IN.)	D2 (IN.)	D3 (IN.)		
47	0.201	0.201	0.203	0.002	0.202

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

¼D= maximum difference between any two diameters,(in.), ¼D¥ 0.004 in.

D AVG= average of D1,D2 and D3.

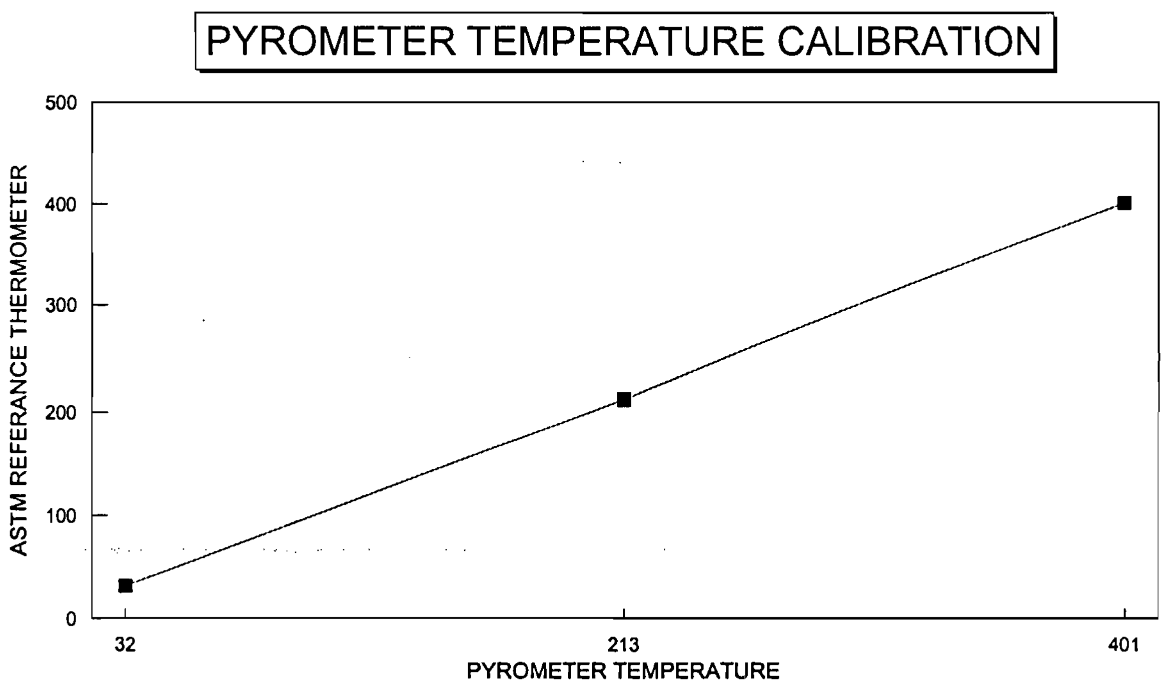
Reviewed By: [signature]
Date: 5/2/2000

SHARDATA\AIR SERVICES\CALS\NOZZLES\POSTTEST\NOZCALF

PYROMETER CALIBRATION

PYROMETER NO.:	*12*	*REFERENCE THERMOMETER:*	*ASTM 2-F*
CTL SERIAL NO.:	*12*	*SERIAL NO.:*	*L98-218*
DATE:	*4-13-00*	*CALIBRATOR:*	*BDR* BDR

REFERENCE TEMP. (F)	*PYROMETER INDICATION*
32	*32*
212	*213*
400	*401*



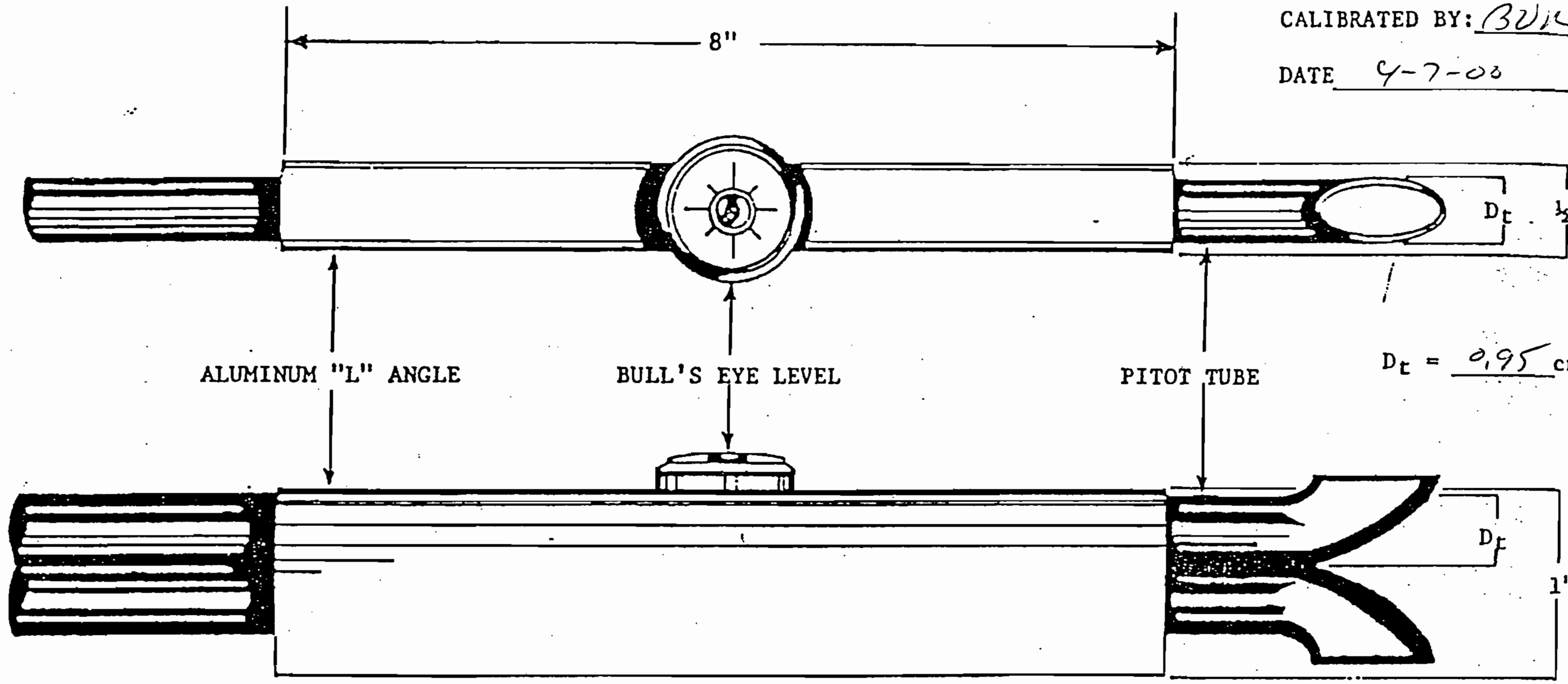
REVIEWED BY: BAM DATE: 5/1/2000

shardata\airservices\cals\pyros\pyro#12

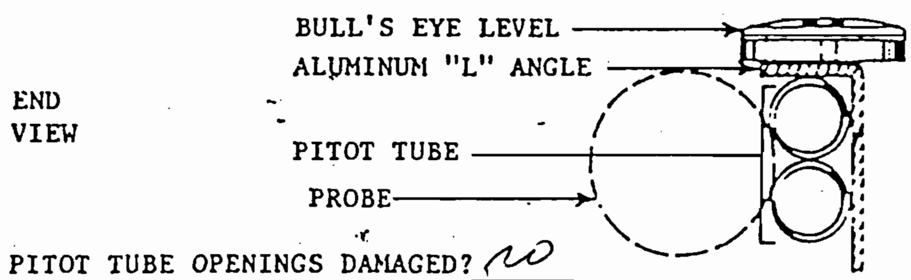
SERIAL NO. 00122

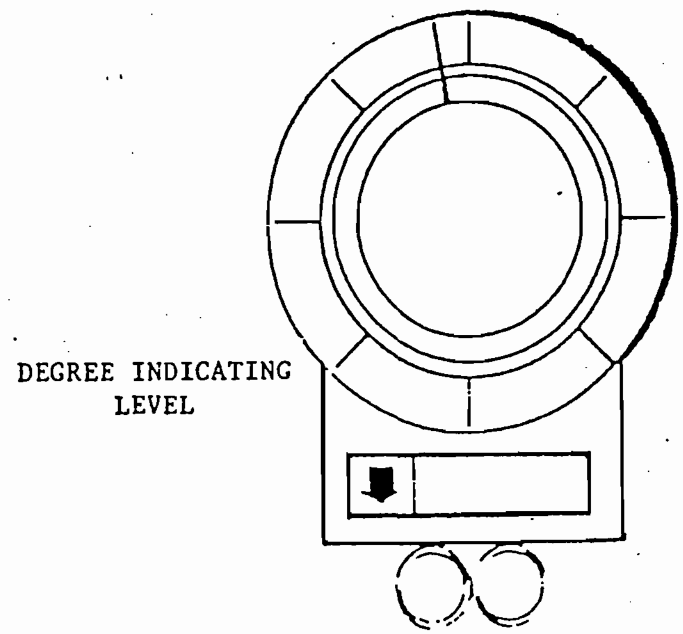
CALIBRATED BY: BUK

DATE 4-7-00



D_t = 0.95 cm.





PITOT TUBE OPENINGS DAMAGED? no

COMMENTS: ____________________

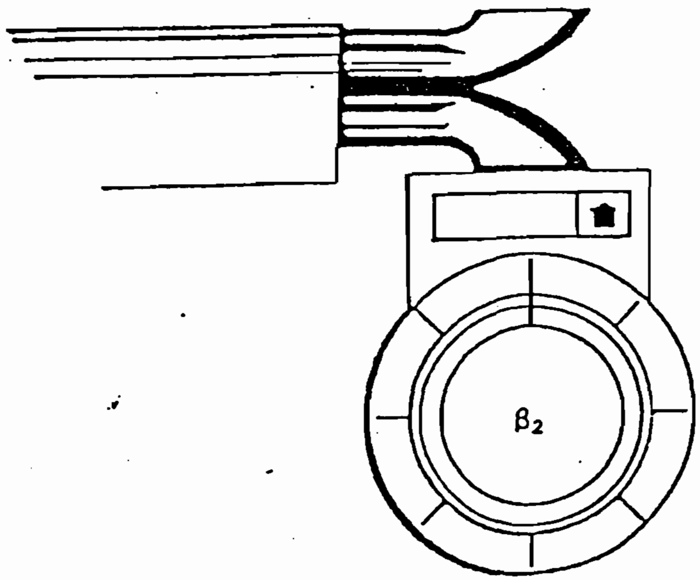
Reviewed By: [signature]
Date: 5/1/2000

PITOT TUBE CALIBRATION SET-UP POSITION

SERIAL NO. 00122

CALIBRATED BY Bun

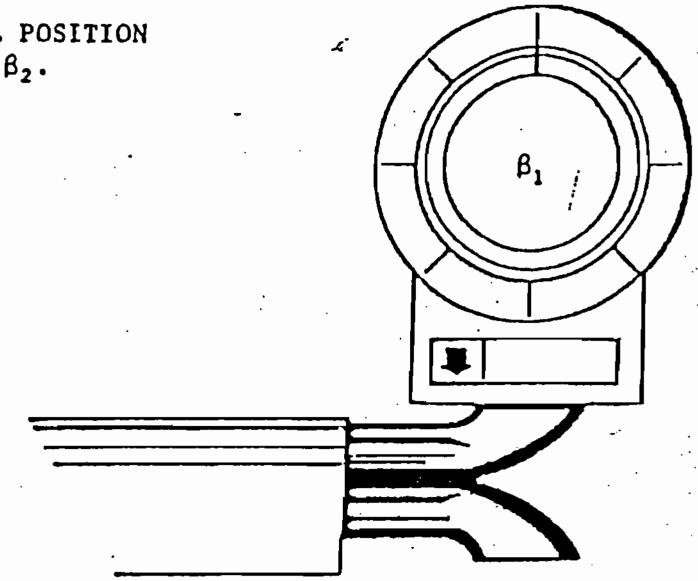
DATE 4-7-00

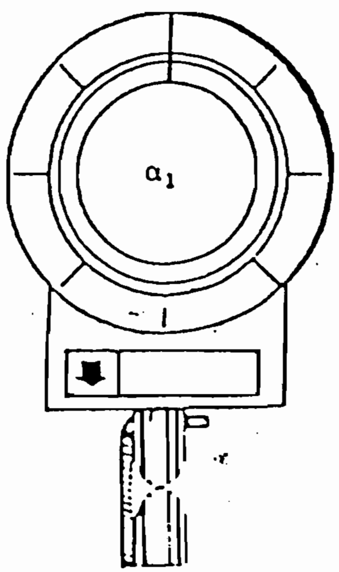


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 0,6 °(<5°)

β_2 = 0,5 °(<5°)

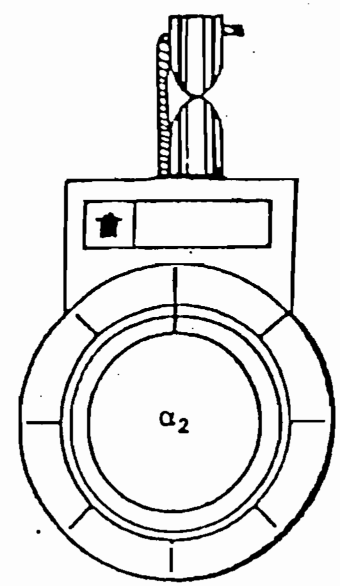




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 1,8 °(<10°)

α_2 = 1,4 °(<10°)



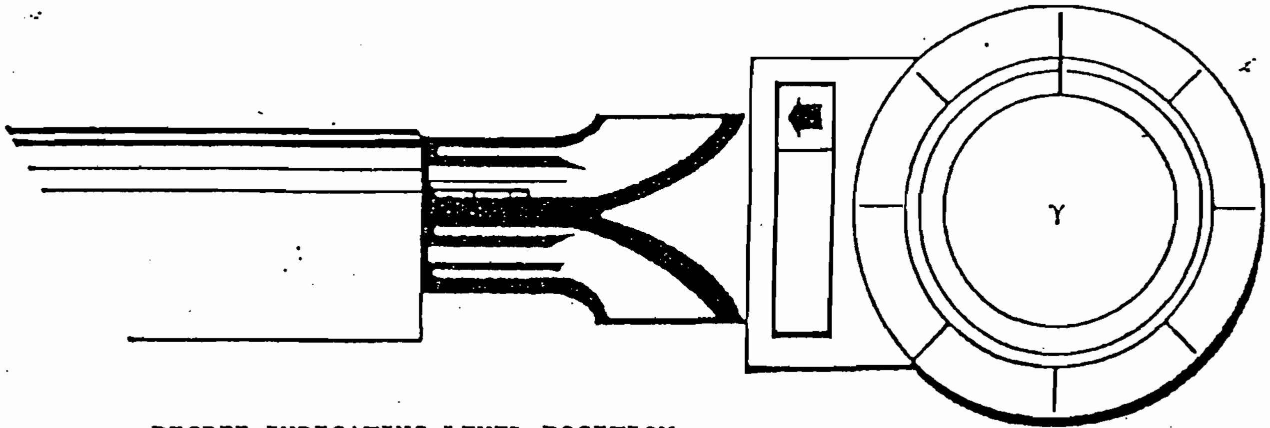
PITOT TUBE CALIBRATION; α and β DETERMINATION

Reviewed By: [signature]
Date: 5/1/2000

SERIAL NO. 00122

CALIBRATED BY Bon

DATE 4-7-00



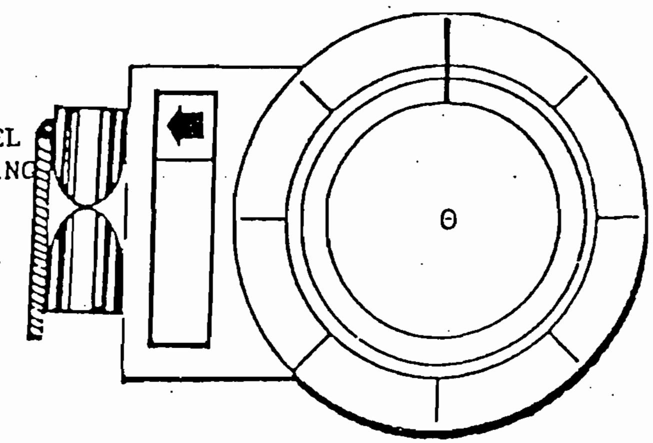
DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

γ = 1.2 °

A = DISTANCE BETWEEN TIPS, ($P_a + P_b$), cm. = 2.35 .

Z = A sin γ = 0.049 cm; (<0.32 cm).

DEGREE INDICATING LEVEL
POSITION FOR DETERMINING
Θ, THEN CALCULATING W.



Θ = 0.5 °

W = A sin Θ = 0.021 cm; (<0.08 cm).

PITOT TUBE CALIBRATION: A, W, γ, Θ and Z DETERMINATION

Reviewed By: [signature]
Date: 5/1/2000

WET TEST METER CALIBRATION DATA FORM

DATE: 1-4-00

BAROMETRIC PRESS: 30.2

WET TEST METER SERIAL NUMBER: 12-AH-4

NAME: BDR 6on

AMBIENT TEMP: 73

RUN NUMBER	VOLUME OF WATER DISPLACED (LITERS) Va	INITIAL METER READING (FT3)	FINAL METER READING (FT3)	NET METER VOLUME (FT3)	NET METER VOLUME (LITERS) Vw	ERROR
1	3.3600	0.0000	0.1180	0.1180	3.3418	-0.005416667
2	3.3600	0.1180	0.2362	0.1182	3.3474	-0.003750000
3	3.3600	0.2362	0.3548	0.1186	3.3588	-0.000357143
4	3.3600	0.3548	0.4730	0.1182	3.3474	-0.003750000
					AVG. ERROR =	-0.003318453

CORRECTION FACTOR: 1.003329501

(1.000 + / - 0.010)

CALCULATIONS:

ERROR = (Vw - Va) / Va

CORRECTION FACTOR (C.F.) = 1 / (1 + AVERAGE ERROR)

* CONVERSION FACTOR , FT3 TO LITERS = FT3 x 28.32

WHEN USING THE WET TEST METER, THE ACTUAL VOLUME OF AIR CAN BE DETERMINED BY THE EQUATION:

Va = Vw x C.F.

WHERE:

Va = ACTUAL VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

Vw = MEASURED VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

C.F. = CORRECTION FACTOR FOR THE WET TEST METER.

REVIEWED BY: KAm

DATE: 2/21/00

REVISED 5-9-96

SHARDATA\AIR SERVICES\CALS\WETTEST\WETCAL

BAROMETER CALIBRATION DATA FORM

DATE: 4-13-00

CALIBRATOR: bdr BOR

INST. NO: 227

COMMENTS: Adjusted after 1015 reading.

TIME OF READING	BAROMETER READING (HG")	REFERENCE STANDARD READING (HG")	DIFFERENCE (HG")
815	30.12	30.11	0.01
1015	30.25	30.13	0.12
1230	30.14	30.15	-0.01
1430	30.08	30.10	-0.02
			0.00
			0.00

*NOTE: BAROMETRIC READINGS MUST AGREE WITHIN 0.1 INCHES HG OF READINGS OBTAINED FROM THE REFERENCE STANDARD, THE NATIONAL WEATHER SERVICE, RUSKIN FL. TO BE DEEMED ACCEPTABLE.

REVIEWED BY: BTM

DATE: 5/1/2000

SHARDATA\AIR SERVICES\CALS\BAROMETER\00227

REVISED 5-9-96

APPENDIX H

CHAIN OF CUSTODY

H-1 BASELINE CHAIN OF CUSTODY

H-2 FUEL BLEND CHAIN OF CUSTODY

H-1 BASELINE CHAIN OF CUSTODY

SAMPLE RECOVERY AND INTEGRITY DATA

Plant Polk Power Station Sample location Unit #1

Field Data Checks

Sample recovery personnel R.A. Barthelette

Person with direct responsibility for recovered samples Same As Above

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Base-1 Isopropanol	2-7-00 DB ~~1-7-00~~ @ 11:56	✓	✓
2	Base-2 "	2-7-00 DB ~~1-7-00~~ @ 15:17	✓	✓
3	Base-3 "	2-7-00 DB ~~1-7-00~~ @ 17:13	✓	✓
4	Base-4 "	2-7-00 ~~1-7-00~~ @ 19:10	✓	✓
5		DB		
6				
Blank				

Remarks

Signature of field sample trustee [signature]

Laboratory Data Checks

Lab person with direct responsibility for recovered samples [signature]

Date recovered samples received 2·8·00 @ 0700

Analyst [signature]

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Base 1 - Isopropanol	2·8·00 @ 0700	✓	✓
2	Base 2 - "	2·8·00 @ 0700	✓	✓
3	Base 3 - "	2·8·00 @ 0700	✓	✓
4	Base 4 - "	2·8·00 @ 0700	✓	✓
5				
6				
Blank				

H-2 FUEL BLEND CHAIN OF CUSTODY

TAMPA ELECTRIC COMPANY
SAMPLE CHAIN OF CUSTODY

GENERATING STATION Polk

SOURCE IDENTIFICATION Unit 1 60% Petcoke

DATE OF TEST 4/24/00

POLLUTANT SAMPLED H_2SO_4

SAMPLE RECOVERY

LOCATION Corporate Environmental Services

DATE / TIME 4/24/00 23:00

SIGNATURE C. Coronado

TITLE Tech.

SAMPLE ANALYSIS

LOCATION **CORPORATE ENVIRONMENTAL SERVICES**

DATES 4-25-00 @ 8:00

SIGNATURE

TITLE

CONTAINER CODE	SAMPLE IDENTIFICATION	ANALYTICAL METHOD
AA54563 ISO Run 1 @ 12:15	isopropanol	USEPA 8
ISO Run 2 @ 14:31	isopropanol	
ISO Run 3 @ 19:13	isopropanol	

TAMPA ELECTRIC COMPANY
SAMPLE CHAIN OF CUSTODY

GENERATING STATION Polk

SOURCE IDENTIFICATION Unit 1 60 % Petcoke

DATE OF TEST 4/24/00

POLLUTANT SAMPLED H_2SO_4

SAMPLE RECOVERY

LOCATION Corporate Environmental Services

DATE / TIME 4/24/00 23:00

SIGNATURE C. Coronado

TITLE Tech.

SAMPLE ANALYSIS

LOCATION **CORPORATE ENVIRONMENTAL SERVICES**

DATES 4·25·00 @ 8:00

SIGNATURE

TITLE

CONTAINER CODE	SAMPLE IDENTIFICATION	ANALYTICAL METHOD
H_2O_2 Run 1 @ 12:29	Hydrogen Peroxide	USEPA 8
H_2O_2 Run 2 @ 14:53		
H_2O_2 Run 3 @ 19:31		

SAMPLE RECOVERY AND INTEGRITY DATA

Plant F.J. GANNON STATION Sample location UNIT 03

Field Data Checks

Sample recovery personnel CRAIG V. CORONADO

Person with direct responsibility for recovered samples CRAIG V. CORONADO

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	RUN 1 H_2O_2	4/28/00 @ 335	✓	✓
2	RUN 2 H_2O_2	4/28/00 @ 507	✓	✓
3	RUN 3 H_2O_2	4/28/00 @ 645	✓	✓
4				
5				
6				
Blank				

Remarks WDF BASELINE

Signature of field sample trustee Craig V. Coronado

Laboratory Data Checks

Lab person with direct responsibility for recovered samples

Date recovered samples received [signature] 4-28-00

Analyst

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1				
2				
3				
4				
5				
6				
Blank				

Remarks

Signature of lab sample trustee

SAMPLE RECOVERY AND INTEGRITY DATA

Plant Polk Power Station Sample location HRSG Unit No. 1

Field Data Checks

Sample recovery personnel Craig V. Coronado

Person with direct responsibility for recovered samples Craig V. Coronado

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Run 6 Iso	4-25-2000 ~~14:23~~ 14:33	✓	✓
2	Run 7 Iso	" 16:28	✓	✓
3	Run 8 Iso	" 18:22	✓	✓
4	Run 9 Iso	" 20:07	✓	✓
5				
6				
Blank				

Remarks

Signature of field sample trustee Craig V. Coronado

Laboratory Data Checks

Lab person with direct responsibility for recovered samples [illegible signature]

Date recovered samples received 4.26.00 @ 6:15

Analyst [illegible signature] / [illegible signature]

AA54564

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	RUN 6 Iso	✓		✓
2	RUN 7 Iso	✓		✓
3	RUN 8 Iso	✓		✓
4	RUN 9 Iso	✓		✓
5				
6				
Blank				

Remarks

Signature of lab sample trustee

SAMPLE RECOVERY AND INTEGRITY DATA

Plant Polk Power Station Sample location HRSG Unit No. 1

Field Data Checks

Sample recovery personnel Craig V. Coronado

Person with direct responsibility for recovered samples Craig V. Coronado

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Run 6 H_2O_2	4-25-2000 14:52	✓	✓
2	Run 7 H_2O_2	" 16:31	✓	✓
3	Run 8 H_2O_2	" 18:27	✓	✓
4	Run 9 H_2O_2	" 20:09	✓	✓
5				
6				
Blank				

Remarks

Signature of field sample trustee Craig V. Coronado

Laboratory Data Checks

Lab person with direct responsibility for recovered samples [illegible signature]

Date recovered samples received 4·26·00@ 6:15

Analyst [illegible signature]

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	RUN 6 H_2O_2	4·26·00@0615	✓	✓
2	RUN 7 H_2O_2	4·26·00@ 6:15	✓	✓
3	RUN 8 H_2O_2	4·26·00@ 6:15	✓	✓
4	RUN 9 H_2O_2	4·26·00@ 6:15	✓	✓
5				
6				
Blank				

Remarks

Signature of lab sample trustee

SAMPLE RECOVERY AND INTEGRITY DATA

Plant Polk Power Station Sample location HRSG Unit No. 1

Field Data Checks

Sample recovery personnel Craig V. Coronado

Person with direct responsibility for recovered samples Craig V. Coronado

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Run 10 ISO	4-26-00 @ 11:29	✓	✓
2	Run 11 ISO	4-26-00 @ 13:15	✓	✓
3				
4				
5				
6				
Blank				

Remarks

Signature of field sample trustee Craig V. Coronado

Laboratory Data Checks

Lab person with direct responsibility for recovered samples

Date recovered samples received

Analyst [illegible signature]

AA54565

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1				
2				
3				
4				
5				
6				
Blank				

Remarks

Signature of lab sample trustee

SAMPLE RECOVERY AND INTEGRITY DATA

Plant POLK POWER STATION Sample location HRSG UNIT 1

Field Data Checks

Sample recovery personnel CRAIG V. CORONADO

Person with direct responsibility for recovered samples CRAIG CORONADO

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	RUN 10 H_2O_2	4/26/00 @ 1137	✓	✓
2	RUN 11 H_2O_2	4/26/00 @ 1319	✓	✓
3				
4				
5				
6				
Blank				

Remarks

Signature of field sample trustee Craig V. Coronado

Laboratory Data Checks

Lab person with direct responsibility for recovered samples U. Gonzalez

Date recovered samples received 4-27-00

Analyst U. Gonzalez

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1				
2				
3				
4				
5				
6				
Blank				

Remarks

Signature of lab sample trustee Ullelia Gonzalez

APPENDIX I

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

Environmental Affairs

Gregory M. Nelson, P.E.	Director
Patrick Shell	Administrator- Air Programs
David Smith	Coordinator- Air Services
Robert Barthelette Jr.	Environmental Technician
Craig Coronado	Technician
Linda Kong	Engineer Associate
Raymond McDarby	Senior Environmental Technician
Glenn Naslund	Environmental Technician
Bruce Rodriguez	Technician
James Werner	Technician

Polk Power Station

David Knapp	Environmental And Safety Engineer
John McDaniel, P.E.	Senior Engineer
Preston Moore	IGCC Specialist

TAMPA ELECTRIC

RECEIVED
JUN 12 2000
BUREAU OF AIR REGULATION

June 12, 2000

Mr. A.A. Linero, P.E.
Administrator
New Source Review Section
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7923 4277 6097

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petcoke Test Burn Report

Dear Mr. Linero:

Please find enclosed the final signed and sealed report addressing the 60% petcoke 40% coal blend test burn at the Polk Power Station. I was out of the office at the time that this report was finalized and, therefore, unable to sign and seal it.

Should you have any questions, please feel free to contact Shannon K. Todd or me at (813) 641-5016.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Director
Environmental Affairs

RECEIVED
JUN 13 2000
BUREAU OF AIR REGULATION

EP\gm\SKT176

Enclosure

c/enc: Mr. Syed Arif, FDEP
Mr. Buck Oven, FDEP
Mr. Bill Thomas, FDEP - SWD

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111

AN EQUAL OPPORTUNITY COMPANY
HTTP://WWW.TAMPAELECTRIC.COM

(813) 228-4111

CUSTOMER SERVICE:
HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

's your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. Gregory Nelson, PE
Director - Env. Planning
Tampa Electric Co.
P O . BOX 111
Tampa, Fl 33601-0111

4a. Article Number
Z 341 355 303

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

7. Date of Delivery
JUN

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

Thank you for using Return Receipt Service.

...rn Receipt

Z 341 355 303

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

Sent to Gregory Nelson	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Pofacke 5-30-00 Polk Power St. Unit 1	

PS Form **3800**, April 1995

Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

May 30, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Director – Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Petcoke Test Burn Report
Polk Power Station Unit 1

Dear Mr. Nelson:

The Department has received the response to our incompleteness letter on May 1, 2000, regarding the pollutant emissions of the above referenced unit while firing syngas produced from blends of 40 percent petroleum coke (petcoke) and 60 percent coal. Based on our review of the response, the Department would like to reiterate the following concerning the increase in sulfuric acid mist emissions:

1. The test data submitted with the report under Appendix A-1 shows the sulfuric acid emission rate under baseline conditions to be 31.12 lb/hr, average for 8 runs. Appendix A-2 of the report indicates the sulfuric acid emission rate under blend conditions to be 33.35 lb/hr, average for 8 runs. The baseline sulfuric acid emission rate converts to 136.3 tons per year (TPY) based on continuous operation, while the blend sulfuric acid emission rate converts to 146.1 TPY. The difference between the two emission rates is more than 9 TPY.

2. Rule 62-210.200(12), F.A.C, defines actual emissions of a pollutant from an emissions unit in TPY while Rule 62-212.400(2)(e) 2, F.A.C, defines significant net emissions increase for a pollutant in terms of TPY in Table 212.400-2. The rule is clear, whether in determining actual emissions or in determining whether a certain pollutant will undergo Prevention of Significant Deterioration (PSD) review, the emissions has to be determined in TPY and not in lb/MMBtu. Table 212.400-2 lists the significant emission rate for sulfuric acid mist as 7 TPY. The PSD review is triggered for H_2SO_4 for emissions increases of more then 7 TPY. The testing at your facility indicated sulfuric acid mist emissions increase of more than 9 TPY.

3. Any future modification to allow permanent firing of syngas produced from blends of petcoke/coal will require a PSD review for this pollutant, unless measures are taken to reduce the emissions below 7 TPY. A PSD review will require a Best Available Control Technology (BACT) determination. A BACT Determination for H_2SO_4 at your facility could very well be

the control equipment already in place. This will have to be proven in the application for modification to allow permanent firing of syngas from blends of petcoke/coal.

If there are any questions regarding this matter, please call Syed Arif, P.E. at (850) 921-9528.

Sincerely,

FOR AAL

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

AAL/sa

cc: Buck Oven, DEP
Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
AIR PROGRAMS REPORT

NITROGEN OXIDES - BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION
SOURCE EMISSION TEST #4

POLK POWER GENERATING STATION
AIRS # 1050233

UNIT NO.1 COMBUSTION TURBINE &
HEAT RECOVERY STEAM GENERATOR
FIRED ON SYNGAS

APRIL 17, 2000

Prepared by Tampa Electric Company
Corporate Environmental Services
April 28, 2000

TAMPA ELECTRIC

RECEIVED
MAY 17 2000
BUREAU OF AIR REGULATION

May 16, 2000

Mr. Clair Fancy
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7908 4173 6102

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine – Test #4

Dear Mr. Fancy:

As per Specific Condition A.49 of the Polk Power Station Title V Permit, Tampa Electric has completed the fourth NO_x BACT Determination Test on the combustion turbine while operating on syngas. Accordingly, the final report is attached for your review. The next test is tentatively scheduled to take place on June 13, 2000. If you have any questions, please feel free to contact Shannon Todd or me at (813) 641-5125.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Manager
Environmental Planning

EP\gm\SKT163

Enclosure

c/enc: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

REPORT CERTIFICATION

I have calculated and reviewed all data in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 5/10/2000 Signature

QA/QC Coordinator
Senior Environmental Technician
Environmental Affairs
Tampa Electric Company

The sampling and analysis performed for this report were carried out under my direction, and I hereby certify that this test report is authentic and accurate.

Date 5/10/00 Signature

Test Team Leader
Coordinator- Air Services
Environmental Affairs
Tampa Electric Company

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 5/11/00 Signature

Administrator-Air Programs
Environmental Affairs
Tampa Electric Company

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SECTION **PAGE NO.**

APPENDICES

1.0 SUMMARY OF RESULTS

On April 17, 2000, Corporate Environmental Services, Air Services and Auditing group of Tampa Electric Company performed source emission tests on IGCC Unit No. 1 at the Polk Power Station. The combustion turbine was fired with syngas from a coal gasification system. This test was conducted to satisfy requirements in Title V permit no. 1050233-001-AV for NOx Best Available Control Technology (BACT) determinations. Testing was performed according to USEPA test methods as referenced in 40 CFR Part 60, Appendix A.

The Nitrogen Oxides (NO_x) emission rate was derived from three test runs. The calculated average was 17 ppm corrected to 15% oxygen on a dry basis.

During the tests on April 17, 2000, Unit No. 1 Combustion Turbine was operated at an average load of 191 megawatts. Details of turbine operation are included in Appendix C.

2.0 SOURCE DESCRIPTION/TEST PROCEDURES

Polk Power Station is located at County Road 630 approximately 13 miles southwest of Bartow, Polk County, Florida. Unit No. 1 is an IGCC generating unit, 192 MW capacity when fired with Syngas fuel. The source sampling location consists of a circular stack 19 ft. in diameter with four sample ports located 90° apart on the stack circumference. A diagram of the stack sampling location is included in Figure 1 and 2 along with other pertinent information on the test site.

Nitrogen Oxides sampling was performed in accordance with USEPA Reference Method 20 (40 CFR Part 60, Appendix A) "Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines". Testing was performed using a Thermo Environmental Model 10 A/R Chemiluminescent NO-NO_x Gas Analyzer. Details of fuel bound nitrogen is found in Appendix B.

Diluent sampling was performed in accordance with USEPA Reference Method 3-A (40 CFR Part 60, Appendix A), "Determination of Oxygen and Carbon Dioxide concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)". Testing was performed using a Servomex 1400 B Oxygen Analyzer.

TCEMS Description

The following discussion briefly outlines the operation principles of Corporate Environmental Services Transportable Continuous Emissions Monitoring System (TCEMS). Additional information on instrument operation may be found in the individual instrument manuals provided by the manufacturers. A schematic of the TCEMS set-up is presented in Figure 3.

Servomex Model 1400 B O_2 Analyzer

The Servomex 1400B oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

Thermo Environmental Instruments Model 10A/R NO/NOx Analyzer

The Thermo Environmental Instruments model 10A/R NO/NOx analyzer automatically and continuously determines the concentration of nitric oxide (NO) and/or oxides of nitrogen (NO_x) in a flowing gas mixture. The analytical technique is chemiluminescence.

To measure NO concentrations, the gas sample to be analyzed is blended with ozone (O_3) in a reaction chamber. The resulting chemiluminescence activity is monitored through an optical filter by a high sensitivity photomultiplier tube positioned at one end of the chamber.

This filter and photomultiplier combination responds to light of a narrow wavelength band unique to the NO/O_3 reaction, producing an interference free signal. The output from the photomultiplier is linearly proportional to the NO concentration.

To measure NO_x concentrations (i.e., NO plus NO_2), the sample gas flow is diverted through an NO_2-to-NO converter. The chemiluminescent action in the reaction chamber to the converter effluent is linearly proportional to the NO_x concentration entering the converter.

Data Acquisition System

The data acquisition system (DAS) developed by Entropy Environmentalists Inc. uses a portable personal computer with an internal 32 bit analog-to-digital converter with an external 16 channel multiplexer. In addition to providing an instantaneous display of analyzer responses, the DAS can average data, calculate emission rates, and document analyzer calibrations. The test results and calibrations are stored on the hard disk and printed on a dot matrix printer.

TCEMS Sample Handling System

The extractive monitors utilized in the TCEMS require that the effluent stream be conditioned to eliminate any possible interference (i.e., water vapor and particulate matter), before being transported and injected into each analyzer. Figure 3 depicts a schematic of the entire sample handling system. The major components of this system are listed below:

- Gas transport tubing
- Moisture removal system
- Sampling pump

Gas Transport Tubing

Two separate 1/4 inch O.D. Teflon tubes were used for the sample gas transport.

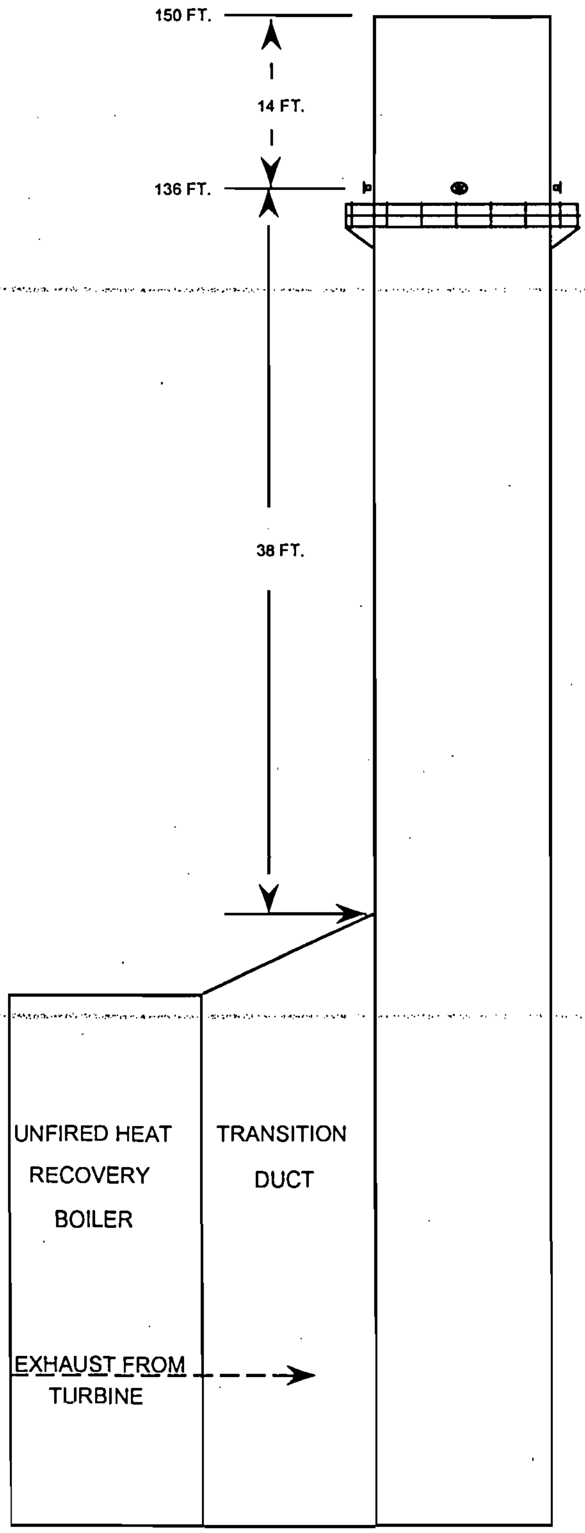
Moisture Removal System

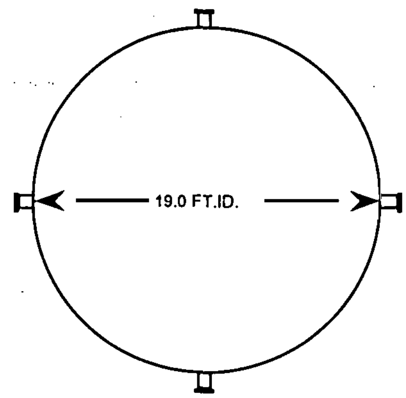
The moisture removal system was comprised of an ice bath condenser, constructed of a 30-foot section of 3/8 inch O.D. Teflon tubing wrapped in a 12-inch coil. Effluent travels through this coil and then passes, in series, through two stainless steel moisture traps where the condensate drops out and is removed via a condensate discharge pump. With the exception of the discharge pump, the entire assembly is chilled in an ice bath.

Sampling Pump

The Thomas Model 2107CE20-TFE pump is used to transport the effluent sample through the conditioning system to the analyzers. All internal parts of the pump that come into contact with the gas sample are constructed of 316 stainless steel or Teflon.

POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION





PORT LOCATION PLAN

STACK DIAMETERS DOWNSTREAM FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.

OXYGEN
TRAVERSE
POINTS

1 - 2.51"	7 - 36.71"
2 - 7.30"	8 - 44.23"
3 - 12.54"	9 - 52.44"
4 - 18.01"	10 - 62.02"
5 - 23.94"	11 - 73.64"
6 - 30.10"	12 - 90.74"

ADD 13" PORT LENGTH
TO POINTS

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FIGURE 1

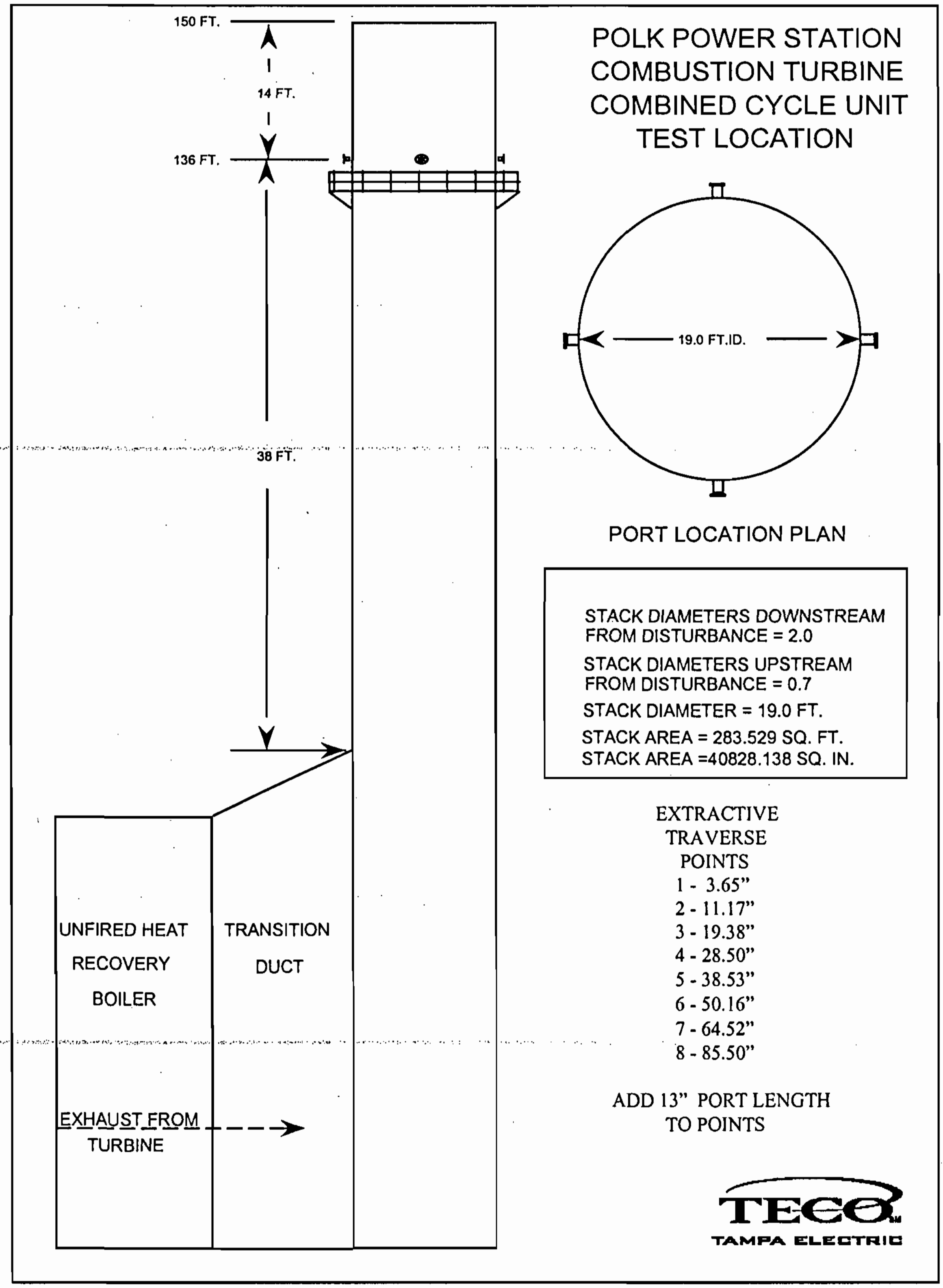
POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION
150 FT.
14 FT.
136 FT.
38 FT.
UNFIRED HEAT RECOVERY BOILER
TRANSITION DUCT
EXHAUST FROM TURBINE
19.0 FT.ID.
PORT LOCATION PLAN
STACK DIAMETERS DOWNSTREAM FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.
EXTRACTIVE TRAVERSE POINTS
1 - 3.65”
2 - 11.17”
3 - 19.38”
4 - 28.50”
5 - 38.53”
6 - 50.16”
7 - 64.52”
8 - 85.50”
ADD 13” PORT LENGTH TO POINTS
TECO
TAMPA ELECTRIC

FIGURE 2

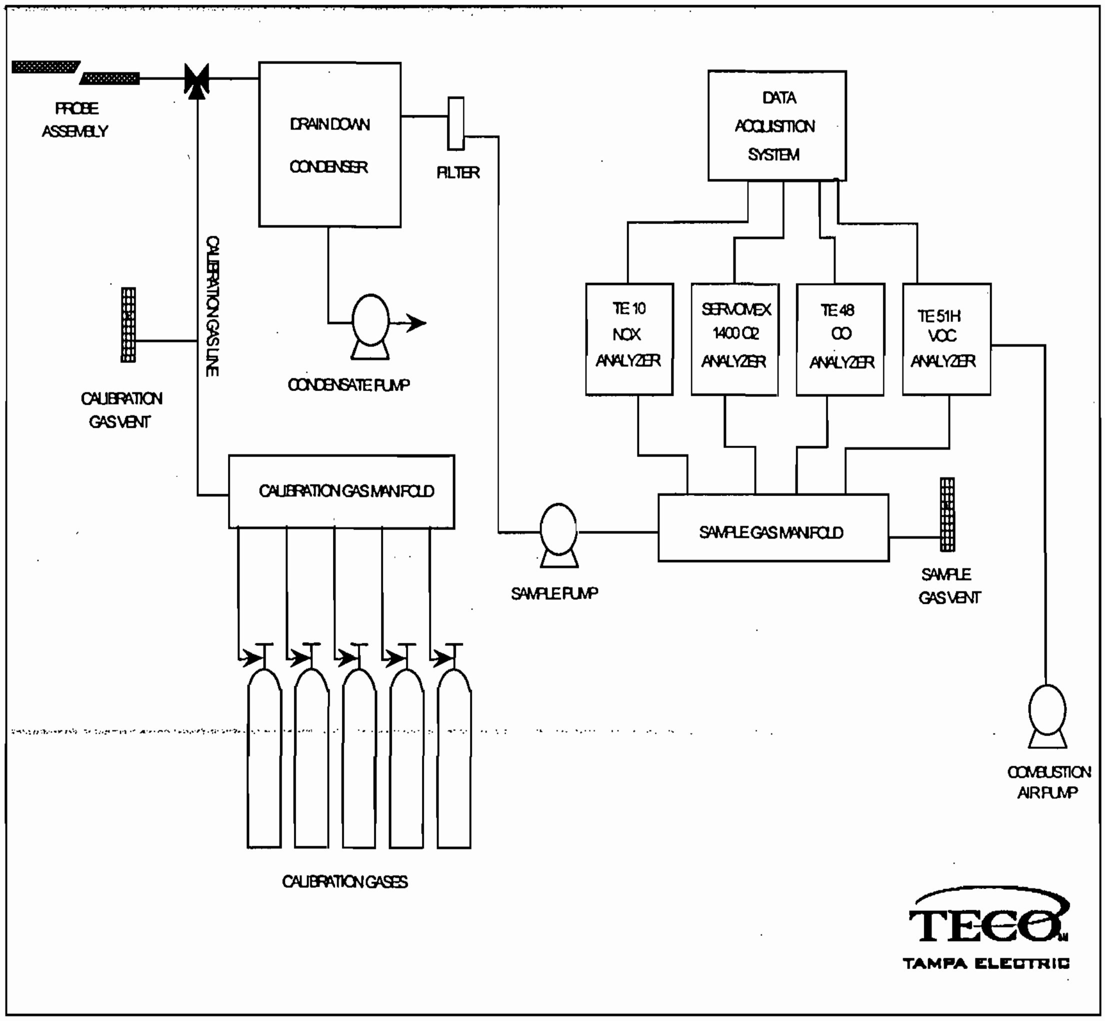

FIGURE 3
Extractive Method Sampling Trains
USEPA METHODS 3A, 10, 20, 25A

3.0 TEST RESULTS

POLK POWER ELECTRICAL GENERATING STATION
NITROGEN OXIDES BACT TESTING

IGCC COMBUSTION TURBINE UNIT 1
FEBRUARY 7, 2000

RUN NO.	TIME	O2%	ppm NOx Dry	CORRECTED 15% O2
1	1123 – 1222	12.1	26.0	17.4
2	1228 – 1327	11.9	26.0	17.0
3	1334 – 1433	12.0	25.0	16.6
	Average	12.0	25.7	17.0

Corrected NOx calculated as:

Concentration (ppm NOx) x (Cd / (20.9 - %O_2))

Where:

Cd = NOx coefficient of 5.9

APPENDIX A

SOURCE TEST CALCULATIONS

APPENDIX A - 1 NITROGEN OXIDE CALCULATIONS

APPENDIX A - 2 OXYGEN CALCULATIONS

APPENDIX A - 1

NITROGEN OXIDE CALCULATIONS

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	0.9	3.6	2.2
24.9 ppm NOx	24.6	27.3	25.9
0.00 % Oxygen	0.02	-0.02	0.00
11.96 % Oxygen	11.96	12.00	11.98

$\bar{C}$(NOx) = 26.8 $\bar{C}$(O2) = 12.09

CORRECTED RESULTS

26 ppm NOx
12.1 % Oxygen
17.4 ppm NOx @15% O2

Corr. Conc. = $C_{ma}(\bar{C} - C_o)/(C_m - C_o)$ (for NOx)

Corr. Conc. = $[(C_{ma} - C_{oa})/(C_m - C_o)](\bar{C} - C_m) + C_{ma}$ (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8094
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	3.6	4.3	3.9
24.9 ppm NOx	27.3	27.6	27.4
0.00 % Oxygen	-0.02	0.04	0.01
11.96 % Oxygen	12.00	11.98	11.99

$\bar{C}$(NOx) = 28.1 $\bar{C}$(O2) = 11.91

CORRECTED RESULTS

26 ppm NOx
11.9 % Oxygen
17.0 ppm NOx @15% O2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - Cm) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8094
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	4.3	4.1	4.2
24.9 ppm NOx	27.6	27.5	27.6
0.00 % Oxygen	0.04	0.07	0.05
11.96 % Oxygen	11.98	12.03	12.00

$\bar{C}$(NOx) = 27.7 $\bar{C}$(O2) = 12.07

CORRECTED RESULTS

25 ppm NOx
12.0 % Oxygen
16.6 ppm NOx @15% O2

Corr. Conc. = Cma($\bar{C}$ - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)]($\bar{C}$ - Cm) + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8094
1.194E-07

APPENDIX A - 2

OXYGEN CALCULATIONS

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 1

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.02	-0.02	0.00
11.96 % Oxygen	11.96	12.00	11.98

$\bar{C}$ = 12.09

CORRECTED RESULTS

12.1 % Oxygen

Corrected Conc. = $Cma(\bar{C} - Co)/(Cm - Co)$

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 2

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	-0.02	0.04	0.01
11.96 % Oxygen	12.00	11.98	11.99

$\bar{C}$ = 11.91

CORRECTED RESULTS

11.9 % Oxygen

Corrected Conc. = $Cma(\bar{C} - Co)/(Cm - Co)$

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 3

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.04	0.07	0.05
11.96 % Oxygen	11.98	12.03	12.00

$\bar{C}$ = 12.07

CORRECTED RESULTS

12.0 % Oxygen

Corrected Conc. = Cma($\bar{C}$ - Co)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

APPENDIX B

TURBINE DATA

All values are averages for time period given

			TEST PERIOD 1
		START TIME	04/17/2000 8:00
		END TIME	04/17/2000 15:00
1TSYFI910	GT SYNGAS MASS FLOW	LB/SEC	102.1605453
1PWRJI900	GT GEN LOAD WATTS	MW	191.7917175
1GMLJI962	GT GENERATOR WATTS	MW	192.5525208
1TSYJYI910	GT SYNGAS LOWER HEATING VA	BTU/LB	216.7936401
1NITFI920A	GT N2 FLOW	LB/SEC	125.0782089
1TMSTI922M	GT CPRSR MAX INL FLANGE TE	F	75.98952484
1TMSPI909	AMBIENT BAR PRESS	IN HGA	29.82071877
spare	Tag not found: -5	Tag not found: -5	Tag not found: -5
spare	Tag not found: -5	Tag not found: -5	Tag not found: -5
spare	Tag not found: -5	Tag not found: -5	Tag not found: -5

1 MINUTE AVERAGES

TEST PERIOD 1
04/17/2000 8:00
04/17/2000 15:00

	GT SYNGAS MASS FLOW 1TSYFI910	GT GEN LOAD WATTS 1PWRJI900	GT GENERATOR WATTS 1GMLJI962	GT SYNGAS LOWER HEATING VA 1TSYJYI910	GT N2 FLOW 1NITFI920A	GT CPRSR MAX INL FLANGE TE 1TMSTI922M	AMBIENT BAR PRESS 1TMSPI909
17-Apr-00 08:00:00	102.0800629	191.499939	192.7823334	174.954071	122.7038116	64.5271225	29.8343792
17-Apr-00 08:01:00	102.7190552	191.6508484	192.7787781	174.954071	122.7006149	64.73358154	29.83431625
17-Apr-00 08:02:00	101.9772263	191.8017731	192.7854767	174.954071	122.6974182	64.94003296	29.8342514
17-Apr-00 08:03:00	102.2221603	191.6301117	192.7927399	174.954071	122.6942215	64.32405853	29.83418846
17-Apr-00 08:04:00	102.4594116	191.8147278	192.7999878	174.954071	122.6910248	64.41249084	29.83412361
17-Apr-00 08:05:00	102.336235	191.5505219	192.8072357	174.954071	122.6878281	64.51459503	29.83406067
17-Apr-00 08:06:00	102.283699	191.6297607	192.8144836	174.954071	122.6846313	64.61670685	29.83399773
17-Apr-00 08:07:00	102.3144455	191.7090149	192.8217316	174.954071	122.6814346	64.87174225	29.83393288
17-Apr-00 08:08:00	102.3074417	191.788269	192.8289948	174.954071	122.6782379	64.79442596	29.83386993
17-Apr-00 08:09:00	102.4938278	191.8675079	192.8362427	174.954071	122.6750412	64.71711731	29.83380699
17-Apr-00 08:10:00	102.1940842	191.9315033	192.8434906	174.954071	122.6718445	64.63980103	29.83374214
17-Apr-00 08:11:00	102.1566544	191.9089813	192.8507385	174.954071	122.6686478	64.8878479	29.8336792
17-Apr-00 08:12:00	102.3242188	191.4641876	192.8298035	174.954071	122.665451	64.68876648	29.83361435
17-Apr-00 08:13:00	102.283699	192.0134583	192.8073883	174.954071	122.6622543	64.76607513	29.83355141
17-Apr-00 08:14:00	102.2116547	191.503067	192.7849731	174.954071	122.6590576	64.84339142	29.83348846
17-Apr-00 08:15:00	101.9756775	191.7552185	192.762558	174.954071	122.6558609	64.9207077	29.83342361
17-Apr-00 08:16:00	102.2350693	191.5054474	192.7401428	174.954071	122.6526642	64.85276794	29.83336067
17-Apr-00 08:17:00	102.4340057	192.0813599	192.7177124	174.954071	122.6494675	65.16075897	29.83329582
17-Apr-00 08:18:00	102.3279724	191.7792358	192.6952972	174.954071	122.6462708	64.99157715	29.83323288
17-Apr-00 08:19:00	102.3982239	191.733078	192.6728821	174.954071	122.643074	65.0688858	29.83316994
17-Apr-00 08:20:00	102.1888428	191.3323364	192.6504669	174.954071	122.6398773	65.14620209	29.83310509
17-Apr-00 08:21:00	102.0012283	191.5506439	192.6280518	174.954071	122.6366882	65.22351074	29.83304214
17-Apr-00 08:22:00	102.283699	191.4921112	192.6056213	174.954071	122.6334915	65.56626892	29.83297729
17-Apr-00 08:23:00	102.3620682	191.6027222	192.5832062	174.954071	122.6302948	65.56626892	29.83291435
17-Apr-00 08:24:00	102.1873398	192.1863556	192.560791	174.954071	122.6270981	65.3363266	29.83285141
17-Apr-00 08:25:00	102.1509476	191.6490936	192.5383759	174.954071	122.6239014	65.48756409	29.83278656
17-Apr-00 08:26:00	102.1188965	191.8101501	192.610199	174.954071	122.6207047	65.63879395	29.83272362
17-Apr-00 08:27:00	102.3359756	191.7957458	192.6887512	174.954071	122.6175079	65.79003143	29.83266068
17-Apr-00 08:28:00	102.1573563	191.8321228	192.7673187	174.954071	122.6143112	65.72863007	29.83259583
17-Apr-00 08:29:00	102.1113892	191.8412018	192.845871	174.954071	122.6111145	65.73370361	29.83253288
17-Apr-00 08:30:00	102.3012466	191.9809418	192.8135071	174.954071	122.6079178	65.91517639	29.83246803
17-Apr-00 08:31:00	102.5132904	191.5194244	192.7732239	174.954071	122.6047211	66.01783752	29.83240509
17-Apr-00 08:32:00	102.2418976	191.9303284	192.7329407	174.954071	122.6015244	66.12050629	29.83234215
17-Apr-00 08:33:00	102.1512527	191.7668915	192.6926422	174.954071	122.5983276	66.06575012	29.8322773
17-Apr-00 08:34:00	102.0916519	192.0357361	192.652359	174.954071	122.5951309	66.09654999	29.83221436
17-Apr-00 08:35:00	102.3254089	192.0222321	192.6120758	174.954071	122.5919342	66.38913727	29.83214951
17-Apr-00 08:36:00	101.991272	191.9484558	192.7458801	174.954071	122.5887375	65.96984863	29.83208656
17-Apr-00 08:37:00	102.0502319	191.5371552	192.8921356	174.954071	122.5855408	65.91726685	29.83202362
17-Apr-00 08:38:00	101.948761	191.4205933	192.5606537	174.954071	122.5823441	66.07254028	29.83195877
17-Apr-00 08:39:00	102.0822067	191.5961914	192.9429474	174.954071	122.5791473	66.41480255	29.83189583
17-Apr-00 08:40:00	102.0076828	191.821701	192.9132996	174.954071	122.5759506	66.23458862	29.83183289
17-Apr-00 08:41:00	102.0578613	191.5532379	192.8504486	174.954071	122.5727539	66.43769073	29.83176804
17-Apr-00 08:42:00	101.6354904	191.5085754	192.7876129	174.954071	122.5695572	66.64080048	29.83170509
17-Apr-00 08:43:00	102.2512131	191.6235809	192.724762	174.954071	122.5663605	66.53799438	29.83164024
17-Apr-00 08:44:00	101.7677231	191.8982544	192.6619263	174.954071	122.5631638	66.77352142	29.8315773
17-Apr-00 08:45:00	101.8529282	191.9258575	192.6619568	174.954071	122.559967	66.56879425	29.83151436
17-Apr-00 08:46:00	102.1802444	192.0161285	192.6665039	174.954071	122.5567703	66.81518555	29.83144951
17-Apr-00 08:47:00	102.011322	191.6120911	192.6710358	174.954071	122.5535736	66.87677765	29.83138657
17-Apr-00 08:48:00	102.2819824	191.7766724	192.6755676	174.954071	122.5503769	66.93837738	29.83132172
17-Apr-00 08:49:00	102.1990128	191.8847351	192.6801147	174.954071	122.5471802	66.99997711	29.83125877

17-Apr-00 08:50:00	102.4567413	191.5862885	192.6846466	174.954071	122.5439835	67.06156921	29.83119583
17-Apr-00 08:51:00	102.3704529	191.6628265	192.6891785	174.954071	122.5407867	67.12316895	29.83113098
17-Apr-00 08:52:00	102.3468094	191.728363	192.6937256	174.954071	122.53759	67.28361511	29.83106804
17-Apr-00 08:53:00	102.0834274	191.7701721	192.6982574	174.954071	122.5343933	67.12834167	29.83100319
17-Apr-00 08:54:00	102.0899811	191.8119659	192.7027893	174.954071	122.5311966	67.14842224	29.83094025
17-Apr-00 08:55:00	102.2104492	191.8748474	192.7073364	174.954071	122.5279999	67.21727753	29.8308773
17-Apr-00 08:56:00	102.1454468	191.8825989	192.7118683	174.954071	122.5248032	67.31993866	29.83081245
17-Apr-00 08:57:00	102.1576309	191.659317	192.7164001	174.954071	122.5216064	67.42260742	29.83074951
17-Apr-00 08:58:00	102.4576569	191.8952026	192.7209473	174.954071	122.5184097	67.17367554	29.83068657
17-Apr-00 08:59:00	102.2104568	191.4175873	192.7254791	174.954071	122.515213	67.25149536	29.83062172
17-Apr-00 09:00:00	102.4706268	191.9390717	192.730011	174.954071	122.5120163	67.40549469	29.83055878
17-Apr-00 09:01:00	102.3415298	191.7229462	192.654129	174.954071	122.5088196	67.55948639	29.83049393
17-Apr-00 09:02:00	102.4736786	191.5856171	192.5740051	174.954071	122.5056229	67.71347809	29.83043098
17-Apr-00 09:03:00	102.4651566	191.6909637	192.4938812	174.954071	122.5024261	67.51709747	29.83036804
17-Apr-00 09:04:00	102.4988556	191.4742432	192.5016937	174.954071	122.4992294	67.66214752	29.83030319
17-Apr-00 09:05:00	102.3275909	191.8277435	192.5157928	174.954071	122.4960327	67.52868652	29.83024025
17-Apr-00 09:06:00	102.5080109	191.8822174	192.529892	174.954071	122.492836	67.78013611	29.8301754
17-Apr-00 09:07:00	102.3084183	191.5405884	192.5439911	174.954071	122.4896393	67.82403564	29.83011246
17-Apr-00 09:08:00	102.237175	192.0544891	192.5580902	174.954071	122.4864426	67.86792755	29.83004951
17-Apr-00 09:09:00	102.3426895	191.8948059	192.5721893	174.954071	122.4832535	67.91182709	29.82998466
17-Apr-00 09:10:00	102.563179	191.7236938	192.5862885	174.954071	122.4800568	67.95571899	29.82992172
17-Apr-00 09:11:00	102.4458694	191.6921997	192.6003876	174.954071	122.47686	67.9996109	29.82985687
17-Apr-00 09:12:00	102.5023804	191.668045	192.6144867	174.954071	122.4736633	68.04351044	29.82979393
17-Apr-00 09:13:00	102.5642166	191.6439056	192.6285858	174.954071	122.4704666	67.91880798	29.82973099
17-Apr-00 09:14:00	102.5598373	192.0948334	192.6426849	174.954071	122.4672699	68.37565613	29.82966614
17-Apr-00 09:15:00	102.4019012	191.8860016	192.6567841	174.954071	122.4640732	68.37565613	29.8296032
17-Apr-00 09:16:00	102.379837	191.8457184	192.6577301	174.954071	122.4608765	68.21139526	29.82954025
17-Apr-00 09:17:00	102.1509476	192.1631775	192.6577301	174.954071	122.4576797	68.40595245	29.8294754
17-Apr-00 09:18:00	102.2653885	191.5661469	192.6577301	174.954071	122.454483	68.19599152	29.82941246
17-Apr-00 09:19:00	102.3281631	191.9743958	192.6577301	174.954071	122.4512863	68.24518585	29.82934761
17-Apr-00 09:20:00	102.2001724	191.4734344	192.6577301	174.954071	122.4480896	68.37565613	29.82928467
17-Apr-00 09:21:00	102.2167587	191.9348755	192.6577301	174.954071	122.4448929	68.37565613	29.82922173
17-Apr-00 09:22:00	102.3659515	191.8089294	192.6577301	174.954071	122.4416962	68.08953857	29.82915688
17-Apr-00 09:23:00	101.9991684	192.0366974	192.6577301	174.954071	122.4384995	68.16668701	29.82909393
17-Apr-00 09:24:00	102.5216675	192.0195923	192.5787811	174.954071	122.4353027	68.24384308	29.82902908
17-Apr-00 09:25:00	101.9592819	191.8890228	192.4941864	174.954071	122.432106	68.32099915	29.82896614
17-Apr-00 09:26:00	102.5805817	192.0130768	192.5449371	174.954071	122.4289093	68.39815521	29.8289032
17-Apr-00 09:27:00	102.4498062	191.8675232	192.6053619	174.954071	122.4257126	68.47531128	29.82883835
17-Apr-00 09:28:00	102.5302887	191.7016296	192.6657867	174.954071	122.4225159	68.55246735	29.82877541
17-Apr-00 09:29:00	102.356636	191.6791077	192.7262115	174.954071	122.4193192	68.62962341	29.82871246
17-Apr-00 09:30:00	102.5129623	191.6183319	192.5624542	174.954071	122.4161224	68.96879578	29.82864761
17-Apr-00 09:31:00	102.2049789	191.5282745	192.3826752	174.954071	122.4129257	68.8160553	29.82858467
17-Apr-00 09:32:00	102.5793381	191.9669189	192.5310822	174.954071	122.409729	68.71465302	29.82851982
17-Apr-00 09:33:00	102.3627625	192.0498352	192.7093201	174.954071	122.4065323	68.86991882	29.82845688
17-Apr-00 09:34:00	102.3668289	191.4966278	192.887558	174.954071	122.4033356	69.31501007	29.82839394
17-Apr-00 09:35:00	102.6050644	191.6312714	192.7092743	174.954071	122.4001389	69.31501007	29.82832909
17-Apr-00 09:36:00	102.4884033	191.661438	192.5055237	174.954071	122.3969421	69.21063995	29.82826614
17-Apr-00 09:37:00	102.8592224	191.8921967	192.5266113	174.954071	122.3937454	68.41671753	29.82820129
17-Apr-00 09:38:00	102.7011337	191.9341125	192.5681458	174.954071	122.3905487	68.99168396	29.82813835
17-Apr-00 09:39:00	102.1526642	191.6647797	192.6096802	174.954071	122.387352	68.78747559	29.82807541
17-Apr-00 09:40:00	102.394104	191.7722626	192.6512146	174.954071	122.3841553	68.58326721	29.82801056
17-Apr-00 09:41:00	102.7115021	191.8797455	192.692749	174.954071	122.3809586	68.37905884	29.82794762
17-Apr-00 09:42:00	102.5624771	191.5913086	192.7342834	174.954071	122.3777618	68.6835556	29.82788277
17-Apr-00 09:43:00	102.5125885	191.6363373	192.7758331	174.954071	122.3745651	68.85179901	29.82781982
17-Apr-00 09:44:00	101.9735565	191.6571503	192.6094055	174.954071	122.3713684	68.69654083	29.82775688
17-Apr-00 09:45:00	102.2033997	192.0222321	192.4281158	174.954071	122.3681717	68.51937866	29.82769203
17-Apr-00 09:46:00	102.4799347	191.297287	192.5062714	174.954071	122.364975	68.67337799	29.82762909
17-Apr-00 09:47:00	102.4702454	191.72966	192.602951	174.954071	122.3702393	68.86641693	29.82756615

17-Apr-00 09:48:00	102.5258713	191.8023071	192.6120453	174.954071	122.3952332	68.71305847	29.8275013
17-Apr-00 09:49:00	102.6446915	191.5009613	192.6148834	174.954071	122.4202271	68.55969238	29.82743835
17-Apr-00 09:50:00	102.3945541	191.7922821	192.6177216	174.954071	122.4452209	68.40632629	29.8273735
17-Apr-00 09:51:00	102.4576569	191.7053833	192.6205597	174.954071	122.4702148	68.62615204	29.82731056
17-Apr-00 09:52:00	102.513031	191.8572388	192.6233978	174.954071	122.4952087	68.61691284	29.82724762
17-Apr-00 09:53:00	102.5620422	191.9871674	192.626236	174.954071	122.5202026	68.92489624	29.82718277
17-Apr-00 09:54:00	102.3432083	192.3497314	192.6290741	174.954071	122.5451965	68.59220123	29.82711983
17-Apr-00 09:55:00	101.8991699	191.5284271	192.6319122	174.954071	122.5701904	68.46051788	29.82705498
17-Apr-00 09:56:00	102.3981476	191.4269714	192.6347351	174.954071	122.5951843	68.32883453	29.82699203
17-Apr-00 09:57:00	102.3748856	191.7151337	192.6375732	174.954071	122.6201782	68.19714355	29.82692909
17-Apr-00 09:58:00	102.7671738	191.7511597	192.6404114	174.954071	122.6451721	68.06546021	29.82686424
17-Apr-00 09:59:00	102.392067	191.7871857	192.6432495	174.954071	122.670166	67.93377686	29.8268013
17-Apr-00 10:00:00	102.6382141	191.8232117	192.6460876	174.954071	122.6951599	67.80208588	29.82673645
17-Apr-00 10:01:00	102.43927	191.8770294	192.6489258	174.954071	122.7201538	67.68848419	29.82667351
17-Apr-00 10:02:00	102.4695587	191.6090698	192.6517639	174.954071	122.7451477	67.58692932	29.82661057
17-Apr-00 10:03:00	102.2925491	191.5858002	192.6546021	174.954071	122.7701416	67.48537445	29.82654572
17-Apr-00 10:04:00	102.5970154	191.5948639	192.6574402	174.954071	122.7951355	67.54238129	29.82648277
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17-Apr-00 12:29:00	102.0252075	191.6418915	192.4815521	246.9883881	126.4192352	81.40151215	29.8172493
17-Apr-00 12:30:00	102.143959	192.0381317	192.4885406	246.9907227	126.4442291	81.29940796	29.81718445
17-Apr-00 12:31:00	102.2150345	191.9022827	192.4885406	246.9930573	126.469223	81.55634308	29.81712151
17-Apr-00 12:32:00	102.1498947	191.8631134	192.4885406	246.9953918	126.4942169	81.87459564	29.81705856
17-Apr-00 12:33:00	101.8189392	191.5131073	192.5320435	246.9977264	126.5192108	81.87459564	29.81699371
17-Apr-00 12:34:00	101.8862	191.8948669	192.5803986	247.0000763	126.5442047	81.87459564	29.81693077
17-Apr-00 12:35:00	101.8412552	191.811264	192.6287384	247.0024109	126.5691986	82.18772125	29.81686592
17-Apr-00 12:36:00	101.8586426	191.7276764	192.6770782	247.0047455	126.5941925	81.80273438	29.81680298
17-Apr-00 12:37:00	102.1164932	192.0825653	192.7254181	247.0070801	126.6191864	81.61794281	29.81674004
17-Apr-00 12:38:00	101.9057693	192.0645447	192.7737579	247.0094147	126.6441803	82.18772125	29.81667519
17-Apr-00 12:39:00	102.2397995	191.7355499	192.3078461	247.0117493	126.6691742	82.18772125	29.81661224
17-Apr-00 12:40:00	102.2046661	191.8526154	192.3110962	247.0140839	126.6941681	81.98571014	29.81654739
17-Apr-00 12:41:00	101.9544449	191.969696	192.3838501	247.0164185	126.719162	81.51490021	29.81648445

17-Apr-00 12:42:00	101.7502594	191.8448792	192.456604	247.0187531	126.7441559	81.3596344	29.81642151
17-Apr-00 12:43:00	101.8888702	191.6394348	192.5293579	247.0210876	126.7691498	81.10224152	29.81635666
17-Apr-00 12:44:00	101.8686218	191.7606201	192.6021118	247.0234222	126.7941437	81.92592621	29.81629372
17-Apr-00 12:45:00	102.0126419	192.0217743	192.5896454	247.0257568	126.8191376	82.1312561	29.81622887
17-Apr-00 12:46:00	101.8973389	191.7548065	192.5677032	247.0280914	126.8441315	82.33657837	29.81616592
17-Apr-00 12:47:00	102.0145264	192.1852264	192.5457611	247.030426	126.8691254	82.46411896	29.81610298
17-Apr-00 12:48:00	102.2102356	192.2416687	192.523819	247.0327606	126.8941193	82.28053284	29.81603813
17-Apr-00 12:49:00	102.2377396	192.2056427	192.5018921	247.0350952	126.9191132	82.09694672	29.81597519
17-Apr-00 12:50:00	101.9505005	192.1696167	192.47995	247.0374298	126.9441071	81.91335297	29.81591225
17-Apr-00 12:51:00	102.1066589	191.5830536	192.4580078	247.0397644	126.969101	81.72976685	29.8158474
17-Apr-00 12:52:00	101.8199692	191.3667603	192.4360657	247.042099	126.9940948	81.61280823	29.81578445
17-Apr-00 12:53:00	102.2091827	191.7303467	192.4141235	247.0444489	127.0190887	82.18772125	29.8157196
17-Apr-00 12:54:00	102.0947647	192.0163574	192.3921967	247.0467834	127.0440826	82.16684723	29.81565666
17-Apr-00 12:55:00	102.1819229	191.4765015	192.3702545	247.049118	127.0690765	81.87459564	29.81559372
17-Apr-00 12:56:00	101.7343674	191.6836243	192.3753204	247.0514526	127.0940704	81.87459564	29.81552887
17-Apr-00 12:57:00	101.6244965	192.0609589	192.3839722	247.0537872	127.1190643	81.87459564	29.81546593
17-Apr-00 12:58:00	101.7730865	191.4593964	192.3926086	247.0561218	127.1440582	81.87459564	29.81540108
17-Apr-00 12:59:00	101.8002853	192.0920715	192.4012451	247.0584564	127.1690521	81.28942108	29.81533813
17-Apr-00 13:00:00	102.115921	191.6469269	192.4098969	247.060791	127.194046	81.24835968	29.81527519
17-Apr-00 13:01:00	102.2122116	191.7555847	192.4185333	247.0631256	127.2190399	81.84379578	29.81521034
17-Apr-00 13:02:00	102.2381516	191.8642426	192.4271851	247.0654602	127.2440338	81.3291626	29.8151474
17-Apr-00 13:03:00	102.3144989	191.8973541	192.4358215	247.0677948	127.2690277	82.06246948	29.81508446
17-Apr-00 13:04:00	102.2385254	191.7901611	192.444458	247.0701294	127.2940216	83.28620911	29.81501961
17-Apr-00 13:05:00	101.8924103	192.0174255	192.4531097	247.072464	127.3190155	82.41358185	29.81495667
17-Apr-00 13:06:00	101.8871536	191.9431	192.4617462	247.0747986	127.3440094	81.94025421	29.81489182
17-Apr-00 13:07:00	101.8860474	192.0834656	192.4703979	247.0771332	127.3690033	82.36515045	29.81482887
17-Apr-00 13:08:00	102.0058975	192.0924683	192.4790344	247.0794678	127.3939972	83.40098572	29.81476593
17-Apr-00 13:09:00	101.9475555	192.1014709	192.4876709	247.0818024	127.4189911	84.16667175	29.81470108
17-Apr-00 13:10:00	101.9337082	191.7578583	192.4885406	247.084137	127.443985	84.37085724	29.81463814
17-Apr-00 13:11:00	101.8188477	191.7643738	192.4885406	247.0864716	127.4689789	84.37085724	29.81457329
17-Apr-00 13:12:00	102.3027725	191.6653137	192.4885406	247.0888214	127.4939728	83.74533081	29.81451035
17-Apr-00 13:13:00	102.3880768	191.6040649	192.4885406	247.091156	127.5189667	83.23145294	29.8144474
17-Apr-00 13:14:00	101.902916	191.8292084	192.4885406	247.0934906	127.5439606	82.40690613	29.81438255
17-Apr-00 13:15:00	102.2302933	192.0543518	192.4885406	247.0958252	127.5689545	82.06651306	29.81431961
17-Apr-00 13:16:00	102.3413391	191.7702332	192.4885406	247.0981598	127.5939484	81.81813812	29.81425476
17-Apr-00 13:17:00	102.2757645	191.8003998	192.4885406	247.1004944	127.6189423	82.10045624	29.81419182
17-Apr-00 13:18:00	101.7515564	191.8859406	192.4885406	247.102829	127.6439362	83.38800812	29.81412888
17-Apr-00 13:19:00	102.3450394	191.9714966	192.4885406	247.1051636	127.6689301	83.91997528	29.81406403
17-Apr-00 13:20:00	102.019165	191.7946472	192.4885406	247.1074982	127.693924	83.58110046	29.81400108
17-Apr-00 13:21:00	102.494278	191.4283752	192.4885406	247.1098328	127.7189178	83.36576843	29.81393814
17-Apr-00 13:22:00	102.2486038	191.9902649	192.4885406	247.1121674	127.7439117	83.82775116	29.81387329
17-Apr-00 13:23:00	102.2045059	191.79039	192.4885406	247.114502	127.7689056	83.78196716	29.81381035
17-Apr-00 13:24:00	101.9498215	192.018158	192.4885406	247.1168365	127.7938995	83.84336853	29.8137455
17-Apr-00 13:25:00	102.0416794	191.4789276	192.4885406	247.1191711	127.8188934	83.90476227	29.81368256
17-Apr-00 13:26:00	102.2754745	192.017868	192.4885406	247.1215057	127.8438873	83.96615601	29.81361961
17-Apr-00 13:27:00	102.2148056	192.0638733	192.4885406	247.1238403	127.8688812	84.02754974	29.81355476
17-Apr-00 13:28:00	102.0593872	191.9879456	192.4885406	247.1261749	127.8938751	84.15471649	29.81349182
17-Apr-00 13:29:00	102.2104568	191.6128998	192.4885406	247.1285095	127.918869	83.96248627	29.81342697
17-Apr-00 13:30:00	102.303978	191.6571503	192.4885406	247.1308441	127.9438629	84.22709656	29.81336403
17-Apr-00 13:31:00	102.1320343	191.840271	192.4885406	247.133194	127.9688568	83.77311707	29.81330109
17-Apr-00 13:32:00	101.8880234	191.9914551	192.4885406	247.1355286	127.9938507	83.19380951	29.81323624
17-Apr-00 13:33:00	102.2133713	192.1310425	192.4885406	247.1378632	128.0188446	82.42384338	29.81317329
17-Apr-00 13:34:00	101.9888916	191.6643372	192.4885406	247.1401978	128.0363617	82.33383942	29.81310844
17-Apr-00 13:35:00	101.9251099	191.5498657	192.4885406	247.1425323	128.0333099	83.09677887	29.8130455
17-Apr-00 13:36:00	102.0424271	191.7414093	192.4885406	247.1448669	128.0302582	83.9740448	29.81298256
17-Apr-00 13:37:00	102.0514297	191.9329529	192.4885406	247.1472015	128.0272064	83.51206207	29.8129158
17-Apr-00 13:38:00	102.0353546	192.1244965	192.4885406	247.1495361	128.0241547	82.99875641	29.81281853
17-Apr-00 13:39:00	102.1419449	192.31604	192.4885406	247.1518707	128.0210876	82.22878265	29.81271935

17-Apr-00 13:40:00	102.0811539	191.7586365	192.4885406	247.1542053	128.0180359	81.54094696	29.81262016
17-Apr-00 13:41:00	101.9602051	191.6984863	192.4885406	247.1565399	128.0149841	81.38695526	29.81252289
17-Apr-00 13:42:00	102.0525208	192.0344391	192.4885406	247.1588745	128.0119324	81.27915955	29.81242371
17-Apr-00 13:43:00	102.2257156	191.6316071	192.483963	247.1612091	128.0088806	81.31204224	29.81232452
17-Apr-00 13:44:00	102.117775	191.7712097	192.4787903	247.1635437	128.0058289	81.92079163	29.81222725
17-Apr-00 13:45:00	102.1597977	191.7171021	192.4736023	247.1658783	128.0027771	82.78315735	29.81212807
17-Apr-00 13:46:00	102.2037048	191.4559326	192.4684296	247.1682129	127.999733	81.87973022	29.81202888
17-Apr-00 13:47:00	102.156723	192.0646973	192.4632416	247.1705475	127.9966736	82.18772125	29.81193161
17-Apr-00 13:48:00	101.9626694	191.9206085	192.4580688	247.1728821	127.9936218	81.24835968	29.81183243
17-Apr-00 13:49:00	102.1746063	191.7765198	192.4528961	247.1752167	127.9905701	81.2637558	29.81173325
17-Apr-00 13:50:00	102.1612854	191.6902466	192.4477081	247.1775665	127.9875183	81.53622437	29.81163597
17-Apr-00 13:51:00	101.7664108	191.6969757	192.4425354	247.1799011	127.9844666	81.27445221	29.81153679
17-Apr-00 13:52:00	101.4349823	191.7037048	192.4373474	247.1822357	127.9814148	81.67184448	29.81143761
17-Apr-00 13:53:00	102.0572891	191.7104187	192.4321747	247.1845703	127.978363	82.13382721	29.81134033
17-Apr-00 13:54:00	101.8985596	191.7732239	192.4269867	247.1869049	127.9753113	82.40690613	29.81124115
17-Apr-00 13:55:00	101.9318924	191.9668427	192.421814	247.1892395	127.9722595	81.98570251	29.81114197
17-Apr-00 13:56:00	102.0714722	191.8114929	192.4166412	247.1915741	127.9692078	82.64173889	29.81104469
17-Apr-00 13:57:00	101.9820938	192.1286926	192.4124756	247.1939087	127.966156	82.48041534	29.81094551
17-Apr-00 13:58:00	102.0340576	191.860733	192.4084473	247.1962433	127.9631042	82.0719986	29.81084633
17-Apr-00 13:59:00	101.9651031	191.6864624	192.4044189	247.1985779	127.9600525	81.66358185	29.81074905
17-Apr-00 14:00:00	102.0268097	191.8566132	192.4003906	247.2009125	127.9570007	81.56147766	29.81064987
17-Apr-00 14:01:00	101.9965591	191.7000885	192.3963623	247.2032471	127.953949	81.56147766	29.81055069
17-Apr-00 14:02:00	101.6536026	191.5171661	192.392334	247.2055817	127.9508972	81.99984741	29.81045341
17-Apr-00 14:03:00	102.2682114	191.8443604	192.3883057	247.2079163	127.9478378	82.62608337	29.81035423
17-Apr-00 14:04:00	101.9142685	191.853302	192.3842773	247.2102509	127.9447861	82.29377747	29.81025505
17-Apr-00 14:05:00	102.1364594	191.8362274	192.380249	247.2125854	127.9417343	82.59477234	29.81015778
17-Apr-00 14:06:00	101.7645798	191.4868469	192.3762207	247.21492	127.9386826	83.32539368	29.81005859
17-Apr-00 14:07:00	101.4001923	192.0332947	192.3721924	247.2172546	127.9356308	82.93399048	29.80995941
17-Apr-00 14:08:00	102.1333084	191.9056396	192.3681641	247.2195892	127.932579	82.76177216	29.80986214
17-Apr-00 14:09:00	101.8838577	191.7993164	192.3810425	247.2219238	127.9295273	82.85436249	29.80976295
17-Apr-00 14:10:00	101.7857742	191.7975464	192.3961487	247.2242737	127.9264755	82.78829193	29.80966377
17-Apr-00 14:11:00	101.9056244	191.7975464	192.4112549	247.2266083	127.9234238	82.45977783	29.8095665
17-Apr-00 14:12:00	101.5624313	191.5381317	192.4263611	247.2289429	127.920372	82.38278198	29.80946732
17-Apr-00 14:13:00	101.9666901	191.9177094	192.4414673	247.2312775	127.9173203	82.3057785	29.80936813
17-Apr-00 14:14:00	101.9449463	192.0687714	192.4565735	247.2336121	127.9142685	82.22878265	29.80927086
17-Apr-00 14:15:00	101.6597748	191.7441254	192.4716797	247.2337036	127.9112167	81.87459564	29.80917168
17-Apr-00 14:16:00	102.0882797	191.8303833	192.4867859	247.2276764	127.908165	82.18772125	29.80907249
17-Apr-00 14:17:00	102.3992691	191.52948	192.4351654	247.2216339	127.9051132	82.44023895	29.80897522
17-Apr-00 14:18:00	101.799736	191.6264343	192.3747406	247.2155914	127.9020538	82.75492859	29.80887604
17-Apr-00 14:19:00	102.1361618	191.8029022	192.3143005	247.209549	127.8990021	82.60093689	29.80877686
17-Apr-00 14:20:00	101.8887024	192.084259	192.2538757	247.2035065	127.8959503	83.12194824	29.80867958
17-Apr-00 14:21:00	102.1665115	191.8776855	192.3179932	247.197464	127.8928986	83.45585632	29.8085804
17-Apr-00 14:22:00	101.6665192	192.2858429	192.3985748	247.1914368	127.8898468	82.31902313	29.80848122
17-Apr-00 14:23:00	101.8740997	191.7740936	192.4791412	247.1853943	127.886795	81.9021225	29.80838394
17-Apr-00 14:24:00	101.8483429	191.8308258	192.4904785	247.1793518	127.8837433	82.00534821	29.80828476
17-Apr-00 14:25:00	102.0470047	191.887558	192.4926758	247.1733093	127.8806915	82.10858154	29.80818558
17-Apr-00 14:26:00	101.6093292	192.0654449	192.494873	247.1672668	127.8776398	81.94132996	29.8080883
17-Apr-00 14:27:00	102.0706863	191.8274994	192.4970703	247.1612244	127.874588	82.24931335	29.80798912
17-Apr-00 14:28:00	101.9674149	191.7736206	192.4992676	247.1551971	127.8715363	82.44437408	29.80788994
17-Apr-00 14:29:00	102.1729355	191.7197266	192.5014648	247.1491547	127.8684845	82.01319122	29.80779266
17-Apr-00 14:30:00	101.9976273	191.6658478	192.5036469	247.1431122	127.8654327	82.79359436	29.80769348

O_2 Traverse Period

Record#	DATE	TIME	PC1NOX11	PC1CO212	PC1NOX13	PC1GEN14	PC1PRS15	PC1TMP16
1	04/17/2000	093500	0.086	7.960	24.768	190.876	29.883	293.037
2	04/17/2000	093600	0.086	7.954	24.717	191.150	29.885	295.198
3	04/17/2000	093700	0.086	7.955	24.811	191.352	29.886	299.718
4	04/17/2000	093800	0.087	7.951	24.954	191.507	29.884	294.631
5	04/17/2000	093900	0.087	7.941	25.151	191.421	29.885	289.548
6	04/17/2000	094000	0.087	7.949	25.137	191.203	29.886	289.637
7	04/17/2000	094100	0.087	7.945	24.955	191.087	29.886	289.565
8	04/17/2000	094200	0.087	7.947	24.964	191.319	29.886	298.250
9	04/17/2000	094300	0.088	7.945	25.226	191.189	29.887	299.211
10	04/17/2000	094400	0.088	7.939	25.213	191.287	29.884	295.912
11	04/17/2000	094500	0.088	7.942	25.202	191.069	29.884	295.403
12	04/17/2000	094600	0.087	7.949	25.087	191.040	29.884	295.391
13	04/17/2000	094700	0.086	7.947	24.848	191.508	29.883	295.537
14	04/17/2000	094800	0.086	7.942	24.830	191.288	29.882	297.248
15	04/17/2000	094900	0.087	7.919	25.035	191.110	29.881	295.615
16	04/17/2000	095000	0.087	7.915	25.033	191.096	29.883	281.927
17	04/17/2000	095100	0.088	7.920	25.213	191.194	29.881	281.926
18	04/17/2000	095200	0.088	7.925	25.358	191.708	29.881	281.912
19	04/17/2000	095300	0.089	7.914	25.438	191.325	29.883	285.662
20	04/17/2000	095400	0.088	7.938	25.432	191.544	29.883	297.704
21	04/17/2000	095500	0.088	7.942	25.288	191.527	29.883	296.179
22	04/17/2000	095600	0.088	7.935	25.398	191.121	29.882	293.986
23	04/17/2000	095700	0.089	7.942	25.516	191.120	29.884	294.046
24	04/17/2000	095800	0.089	7.960	25.574	191.133	29.882	294.033
25	04/17/2000	095900	0.088	7.978	25.517	190.925	29.883	294.164
26	04/17/2000	100000	0.088	7.978	25.447	190.928	29.883	294.410
27	04/17/2000	100100	0.088	7.980	25.402	191.139	29.881	293.887
28	04/17/2000	100200	0.088	7.981	25.492	191.368	29.881	293.766
29	04/17/2000	100300	0.088	7.994	25.588	191.772	29.880	293.746
30	04/17/2000	100400	0.089	7.991	25.693	191.013	29.883	293.825
31	04/17/2000	100500	0.089	7.985	25.633	191.289	29.881	295.683
32	04/17/2000	100600	0.089	7.984	25.635	190.989	29.883	294.689
33	04/17/2000	100700	0.088	7.975	25.506	191.082	29.883	293.105
34	04/17/2000	100800	0.089	7.974	25.695	190.945	29.882	293.081
35	04/17/2000	100900	0.090	7.972	25.919	191.386	29.882	293.098
36	04/17/2000	101000	0.089	7.981	25.860	191.373	29.881	294.747
37	04/17/2000	101100	0.089	7.978	25.848	191.481	29.880	296.388
38	04/17/2000	101200	0.090	7.978	25.946	191.228	29.883	289.069
39	04/17/2000	101300	0.089	7.972	25.864	191.245	29.883	285.570
40	04/17/2000	101400	0.089	7.974	25.862	191.037	29.883	285.490
41	04/17/2000	101500	0.090	7.982	25.909	191.312	29.882	285.492
42	04/17/2000	101600	0.089	7.988	25.816	191.277	29.882	285.458
43	04/17/2000	101700	0.089	7.985	25.784	190.852	29.881	285.450
44	04/17/2000	101800	0.089	7.981	25.874	190.828	29.883	285.596
45	04/17/2000	101900	0.089	7.986	25.884	191.167	29.886	285.561
46	04/17/2000	102000	0.090	7.981	25.961	191.243	29.885	285.522
47	04/17/2000	102100	0.089	7.981	25.768	191.127	29.885	286.745
48	04/17/2000	102200	0.089	7.989	25.679	191.399	29.885	286.699
49	04/17/2000	102300	0.089	7.989	25.885	191.192	29.883	286.697
50	04/17/2000	102400	0.089	7.984	25.842	190.992	29.883	290.437
51	04/17/2000	102500	0.089	7.992	25.835	191.241	29.885	300.306
52	04/17/2000	102600	0.090	7.993	25.945	190.938	29.881	297.816
53	04/17/2000	102700	0.090	7.982	25.948	190.949	29.881	289.897
54	04/17/2000	102800	0.090	7.978	26.021	191.327	29.880	289.914
55	04/17/2000	102900	0.091	7.973	26.174	191.099	29.877	289.877
56	04/17/2000	103000	0.091	7.967	26.362	190.904	29.879	293.439
57	04/17/2000	103100	0.092	7.965	26.448	191.312	29.882	296.726
58	04/17/2000	103200	0.091	7.963	26.372	191.049	29.883	289.217

59	04/17/2000	103300	0.090	7.965	26.052	190.583	29.881	286.809
60	04/17/2000	103400	0.090	7.969	25.887	190.962	29.880	286.800
61	04/17/2000	103500	0.090	7.974	25.876	191.166	29.880	286.829
62	04/17/2000	103600	0.090	7.978	25.983	191.282	29.880	292.973
63	04/17/2000	103700	0.090	7.974	25.992	191.178	29.881	292.603
64	04/17/2000	103800	0.091	7.973	26.238	191.385	29.881	284.648
65	04/17/2000	103900	0.091	7.965	26.420	191.468	29.878	284.643
66	04/17/2000	104000	0.092	7.953	26.589	191.226	29.879	284.649
67	/ /							
68	/ /	AVE	0.089	7.965	25.615	191.194	29.882	291.315

Run 1

Record#	DATE	TIME	PC1NOX11	PC1CO212	PC1NOX13	PC1GEN14	PC1PRS15	PC1TMP16
1	04/17/2000	112200	0.093	7.984	26.941	191.059	29.861	294.854
2	04/17/2000	112300	0.093	7.984	26.849	190.964	29.860	291.983
3	04/17/2000	112400	0.092	7.994	26.806	191.160	29.859	291.972
4	04/17/2000	112500	0.093	7.996	26.829	191.266	29.859	291.970
5	04/17/2000	112600	0.093	8.003	27.057	191.445	29.860	295.370
6	04/17/2000	112700	0.093	8.003	26.938	191.151	29.858	295.659
7	04/17/2000	112800	0.093	8.008	27.019	191.310	29.855	293.556
8	04/17/2000	112900	0.093	8.005	27.015	191.288	29.852	293.512
9	04/17/2000	113000	0.093	8.003	26.930	191.101	29.847	293.516
10	04/17/2000	113100	0.093	7.994	27.004	191.071	29.848	294.633
11	04/17/2000	113200	0.093	8.001	26.978	190.940	29.849	297.316
12	04/17/2000	113300	0.093	7.987	27.068	191.308	29.850	289.168
13	04/17/2000	113400	0.094	7.982	27.143	191.187	29.852	285.393
14	04/17/2000	113500	0.094	7.979	27.060	191.768	29.849	285.382
15	04/17/2000	113600	0.094	7.981	27.216	191.565	29.850	285.409
16	04/17/2000	113700	0.094	7.987	27.207	191.356	29.853	294.364
17	04/17/2000	113800	0.094	7.985	27.218	191.130	29.855	294.529
18	04/17/2000	113900	0.094	7.982	27.073	191.351	29.849	291.740
19	04/17/2000	114000	0.093	7.984	26.976	191.331	29.850	291.723
20	04/17/2000	114100	0.093	7.978	26.893	191.123	29.849	291.729
21	04/17/2000	114200	0.093	7.979	27.003	191.315	29.852	294.379
22	04/17/2000	114300	0.093	7.982	27.009	191.334	29.850	297.856
23	04/17/2000	114400	0.094	7.985	27.095	191.125	29.849	295.210
24	04/17/2000	114500	0.093	7.973	27.014	191.892	29.844	293.439
25	04/17/2000	114600	0.094	7.977	27.114	191.034	29.844	293.397
26	04/17/2000	114700	0.094	7.980	27.147	191.259	29.845	293.445
27	04/17/2000	114800	0.093	7.989	27.044	191.318	29.850	298.117
28	04/17/2000	114900	0.094	7.987	27.234	191.168	29.847	296.886
29	04/17/2000	115000	0.094	7.983	27.217	191.322	29.842	293.037
30	04/17/2000	115100	0.094	7.975	27.297	191.218	29.844	293.044
31	04/17/2000	115200	0.095	7.976	27.391	191.443	29.846	293.038
32	04/17/2000	115300	0.095	7.981	27.486	191.261	29.846	294.633
33	04/17/2000	115400	0.095	7.976	27.555	191.129	29.845	295.151
34	04/17/2000	115500	0.096	7.973	27.882	191.131	29.845	297.841
35	04/17/2000	115600	0.097	7.975	28.060	191.274	29.846	298.998
36	04/17/2000	115700	0.097	7.979	28.100	191.076	29.845	298.987
37	04/17/2000	115800	0.096	7.985	27.762	190.902	29.843	297.935
38	04/17/2000	115900	0.095	7.981	27.586	191.168	29.844	294.525
39	04/17/2000	120000	0.095	7.974	27.578	191.461	29.842	293.816
40	04/17/2000	120100	0.096	7.978	27.897	191.534	29.839	293.312
41	04/17/2000	120200	0.097	7.965	27.914	191.658	29.839	293.315
42	04/17/2000	120300	0.097	7.965	28.144	191.545	29.840	293.300
43	04/17/2000	120400	0.098	7.958	28.183	191.427	29.838	297.846
44	04/17/2000	120500	0.098	7.960	28.172	191.259	29.836	295.561
45	04/17/2000	120600	0.099	7.966	28.451	190.987	29.833	287.334
46	04/17/2000	120700	0.101	7.807	28.517	191.013	30.011	287.296
47	04/17/2000	120800	0.103	4.911	18.309	191.165	29.836	287.362
48	04/17/2000	120900	0.101	7.571	27.750	191.240	29.838	294.012
49	04/17/2000	121000	0.101	7.753	28.415	190.853	29.838	298.370
50	04/17/2000	121100	0.100	7.769	28.236	191.139	29.837	293.275
51	04/17/2000	121200	0.099	7.788	28.036	191.091	29.838	291.749
52	04/17/2000	121300	0.099	7.802	27.985	191.103	29.840	291.819
53	04/17/2000	121400	0.099	7.829	28.177	191.454	29.841	291.911
54	04/17/2000	121500	0.100	7.830	28.354	191.197	29.836	298.572
55	04/17/2000	121600	0.100	7.830	28.365	191.349	29.833	298.719
56	04/17/2000	121700	0.099	7.855	28.316	191.301	29.829	298.716
57	04/17/2000	121800	0.100	7.872	28.413	191.128	29.831	298.706
58	04/17/2000	121900	0.099	7.878	28.370	191.219	29.832	296.913

59	04/17/2000	122000	0.100	7.892	28.567	191.513	29.833	290.979
60	04/17/2000	122100	0.100	7.902	28.533	191.343	29.831	290.976
61	04/17/2000	122200	0.100	7.909	28.583	191.532	29.829	290.987
62	/ /							
63	/ /	AVE	0.096	7.892	27.418	191.258	29.847	293.747

Run 2

Record#	DATE	TIME	PC1NOX11	PC1CO212	PC1NOX13	PC1GEN14	PC1PRS15	PC1TMP16
1	04/17/2000	122700	0.100	7.942	28.790	190.911	29.833	289.675
2	04/17/2000	122800	0.100	7.956	28.709	190.924	29.834	292.955
3	04/17/2000	122900	0.100	7.962	28.871	191.365	29.833	296.381
4	04/17/2000	123000	0.100	7.962	28.810	191.383	29.831	294.171
5	04/17/2000	123100	0.100	7.961	28.756	191.174	29.828	293.621
6	04/17/2000	123200	0.100	7.964	28.822	191.151	29.830	293.771
7	04/17/2000	123300	0.100	7.965	28.791	191.533	29.827	293.725
8	04/17/2000	123400	0.100	7.951	28.926	191.193	29.825	297.116
9	04/17/2000	123500	0.101	7.949	29.030	191.503	29.825	296.852
10	04/17/2000	123600	0.100	7.948	28.941	191.367	29.825	292.818
11	04/17/2000	123700	0.100	7.943	28.893	190.984	29.823	292.823
12	04/17/2000	123800	0.099	7.960	28.647	191.071	29.825	292.836
13	04/17/2000	123900	0.099	7.954	28.454	191.126	29.826	293.464
14	04/17/2000	124000	0.099	7.967	28.596	190.944	29.825	294.157
15	04/17/2000	124100	0.099	7.963	28.680	191.388	29.824	291.967
16	04/17/2000	124200	0.099	7.970	28.744	191.554	29.827	290.778
17	04/17/2000	124300	0.100	7.968	28.831	191.401	29.820	290.774
18	04/17/2000	124400	0.101	7.973	29.061	191.059	29.820	290.791
19	04/17/2000	124500	0.100	7.972	28.897	191.199	29.824	297.415
20	04/17/2000	124600	0.100	7.980	29.017	191.350	29.824	297.655
21	04/17/2000	124700	0.100	7.969	28.984	191.363	29.821	282.596
22	04/17/2000	124800	0.100	7.966	28.934	191.502	29.823	282.563
23	04/17/2000	124900	0.100	7.983	28.941	191.197	29.818	282.714
24	04/17/2000	125000	0.100	7.987	28.900	191.045	29.820	286.082
25	04/17/2000	125100	0.099	7.996	28.826	191.260	29.821	294.058
26	04/17/2000	125200	0.099	7.999	28.764	191.355	29.820	294.055
27	04/17/2000	125300	0.099	7.993	28.609	191.455	29.815	294.055
28	04/17/2000	125400	0.098	7.988	28.447	191.264	29.812	294.059
29	04/17/2000	125500	0.099	7.977	28.598	190.899	29.814	294.030
30	04/17/2000	125600	0.098	7.979	28.484	190.990	29.815	297.020
31	04/17/2000	125700	0.098	7.987	28.498	191.032	29.812	297.690
32	04/17/2000	125800	0.099	7.991	28.540	190.903	29.817	293.078
33	04/17/2000	125900	0.098	7.988	28.505	191.068	29.813	292.147
34	04/17/2000	130000	0.099	7.989	28.579	191.262	29.810	292.119
35	04/17/2000	130100	0.099	7.974	28.627	191.253	29.825	293.031
36	04/17/2000	130200	0.122	4.956	21.907	191.519	29.888	297.005
37	04/17/2000	130300	0.408	0.189	2.790	191.380	29.892	297.007
38	04/17/2000	130400	1.224	0.059	2.612	191.274	29.897	293.456
39	04/17/2000	130500	1.413	0.050	2.549	191.058	29.903	293.473
40	04/17/2000	130600	1.554	0.045	2.526	191.386	29.909	293.471
41	04/17/2000	130700	1.673	0.042	2.552	191.335	29.916	294.543
42	04/17/2000	130800	1.725	0.040	2.471	191.128	29.926	297.080
43	04/17/2000	130900	1.839	0.036	2.427	190.981	29.942	297.018
44	04/17/2000	131000	1.907	0.034	2.358	191.166	29.960	297.006
45	04/17/2000	131100	1.917	0.033	2.294	191.195	29.976	297.005
46	04/17/2000	131200	1.939	0.032	2.283	191.570	29.990	296.998
47	04/17/2000	131300	2.009	0.030	2.202	191.356	30.003	297.004
48	04/17/2000	131400	1.968	0.030	2.175	191.148	30.015	297.018
49	04/17/2000	131500	1.932	0.030	2.097	191.347	30.016	296.968
50	04/17/2000	131600	1.884	0.032	2.164	191.145	30.015	296.969
51	04/17/2000	131700	1.700	0.035	2.135	190.923	30.016	296.924
52	04/17/2000	131800	1.607	0.036	2.101	191.362	30.016	296.927
53	04/17/2000	131900	1.661	0.034	2.060	191.374	30.013	296.879
54	04/17/2000	132000	1.643	0.035	2.095	191.388	30.008	296.990
55	04/17/2000	132100	1.787	0.032	2.067	190.981	30.004	297.015
56	04/17/2000	132200	1.823	0.031	2.043	191.529	30.080	297.012
57	04/17/2000	132300	0.203	0.293	2.151	191.365	29.889	296.967
58	04/17/2000	132400	0.088	6.116	19.582	191.183	29.805	296.989

59	04/17/2000	132500	0.096	7.585	26.456	191.519	29.803	296.992
60	04/17/2000	132600	0.096	7.686	26.788	191.743	29.803	297.015
61	04/17/2000	132700	0.096	7.698	26.855	191.270	29.804	296.984
62	/ /							
63	/ /	AVE	0.620	5.151	19.283	191.247	29.873	294.291

Run 3

Record#	DATE	TIME	PC1NOX11	PC1CO212	PC1NOX13	PC1GEN14	PC1PRS15	PC1TMP16
1	04/17/2000	133300	0.098	7.830	27.822	191.046	29.805	296.982
2	04/17/2000	133400	0.098	7.870	28.097	191.034	29.803	296.941
3	04/17/2000	133500	0.099	7.870	28.118	191.460	29.800	296.926
4	04/17/2000	133600	0.099	7.879	28.142	191.613	29.802	296.978
5	04/17/2000	133700	0.098	7.898	28.169	191.333	29.803	296.934
6	04/17/2000	133800	0.097	7.905	27.934	191.177	29.804	296.895
7	04/17/2000	133900	0.097	7.923	27.899	191.149	29.804	296.920
8	04/17/2000	134000	0.098	7.932	28.286	191.277	29.805	296.935
9	04/17/2000	134100	0.098	7.927	28.282	191.375	29.804	296.921
10	04/17/2000	134200	0.098	7.932	28.323	191.368	29.807	296.915
11	04/17/2000	134300	0.098	7.948	28.221	191.252	29.807	296.988
12	04/17/2000	134400	0.097	7.957	28.092	191.142	29.804	297.016
13	04/17/2000	134500	0.096	7.940	27.728	191.141	29.797	296.971
14	04/17/2000	134600	0.097	7.926	27.979	191.135	29.800	296.974
15	04/17/2000	134700	0.097	7.931	27.941	191.211	29.797	296.972
16	04/17/2000	134800	0.096	7.922	27.486	191.370	29.822	296.984
17	04/17/2000	134900	0.127	3.467	15.998	191.499	29.863	296.977
18	04/17/2000	135000	0.434	0.109	1.707	191.545	29.872	296.941
19	04/17/2000	135100	0.819	0.054	1.598	191.327	29.878	296.921
20	04/17/2000	135200	1.010	0.045	1.662	191.157	29.888	296.924
21	04/17/2000	135300	1.064	0.042	1.602	191.291	29.894	297.001
22	04/17/2000	135400	1.228	0.038	1.680	191.524	29.900	296.914
23	04/17/2000	135500	1.270	0.036	1.639	191.315	29.906	296.797
24	04/17/2000	135600	1.251	0.035	1.594	191.106	29.911	296.862
25	04/17/2000	135700	1.297	0.035	1.631	191.041	29.913	296.843
26	04/17/2000	135800	1.254	0.034	1.565	191.357	29.913	296.843
27	04/17/2000	135900	1.255	0.035	1.606	191.213	29.913	296.883
28	04/17/2000	140000	1.228	0.035	1.546	191.335	29.913	297.011
29	04/17/2000	140100	1.195	0.036	1.557	191.003	30.056	297.036
30	04/17/2000	140200	0.074	1.481	3.968	191.123	29.798	296.992
31	04/17/2000	140300	0.093	7.075	23.856	190.944	29.797	296.993
32	04/17/2000	140400	0.095	7.618	26.144	191.111	29.797	296.968
33	04/17/2000	140500	0.094	7.687	26.255	190.912	29.799	296.978
34	04/17/2000	140600	0.094	7.720	26.383	190.903	29.799	296.990
35	04/17/2000	140700	0.094	7.739	26.380	190.680	29.795	296.989
36	04/17/2000	140800	0.095	7.756	26.592	191.338	29.794	296.950
37	04/17/2000	140900	0.095	7.787	26.915	191.141	29.795	296.855
38	04/17/2000	141000	0.096	7.820	27.215	191.137	29.792	296.864
39	04/17/2000	141100	0.096	7.823	27.169	191.123	29.793	296.993
40	04/17/2000	141200	0.098	7.664	27.190	191.344	31.411	296.900
41	04/17/2000	141300	0.182	6.948	45.770	191.364	30.991	296.909
42	04/17/2000	141400	0.218	7.618	60.334	191.556	30.990	297.002
43	04/17/2000	141500	0.220	7.632	60.872	191.573	30.983	299.262
44	04/17/2000	141600	0.220	7.629	60.903	191.032	30.982	299.289
45	04/17/2000	141700	0.221	7.627	61.050	191.100	30.985	299.320
46	04/17/2000	141800	0.221	7.635	61.063	191.330	30.989	299.409
47	04/17/2000	141900	0.220	7.654	61.043	191.381	30.987	299.516
48	04/17/2000	142000	0.220	7.654	61.179	191.368	30.988	299.496
49	04/17/2000	142100	0.220	7.649	60.955	191.198	31.288	299.466
50	04/17/2000	142200	0.254	5.667	52.279	190.837	31.337	299.461
51	04/17/2000	142300	0.260	0.338	3.193	191.140	30.820	299.468
52	04/17/2000	142400	0.366	0.110	1.463	191.343	30.821	299.436
53	04/17/2000	142500	0.471	0.084	1.428	191.472	30.823	299.470
54	04/17/2000	142600	0.573	0.068	1.418	191.279	30.819	299.381
55	04/17/2000	142700	0.643	0.060	1.396	191.248	30.824	299.316
56	04/17/2000	142800	0.688	0.054	1.347	191.472	30.828	299.322
57	04/17/2000	142900	0.739	0.050	1.327	191.452	30.825	299.338
58	04/17/2000	143000	0.746	0.048	1.298	191.127	30.824	299.293

59	04/17/2000	143100	0.741	0.046	1.233	191.163	30.372	299.330
60	04/17/2000	143200	0.076	3.525	9.731	191.141	29.791	299.309
61	04/17/2000	143300	0.095	7.516	25.778	191.140	29.785	299.364
62	/ /							
63	/ /	AVE	0.387	4.826	22.738	191.234	30.198	297.702

APPENDIX C

UNCORRECTED REFERENCE METHOD DATA SHEETS

POLK POWER STATION BACT TEST #4   04-17-2000

TIME	CHAN 5 STACK %O2
09:36	12.15
09:37	12.15
09:38	12.15
09:39	12.16
09:40	12.16
09:41	12.17
09:42	12.17
09:43	12.17
09:44	12.15
09:45	12.14
09:46	12.17
09:47	12.17

AVERAGE VALUES FOR THE LAST 12 MINUTES

09:47	12.16

COMMENTS: O2 TRAVERSE
EAST PORT

POLK POWER STATION BACT TEST #4   04-17-2000

	CHAN 5 STACK
TIME	%02
09:55	12.19
09:56	12.18
09:57	12.18
09:58	12.17
09:59	12.18
10:00	12.17
10:01	12.13
10:02	12.13
10:03	12.13
10:04	12.14
10:05	12.15
10:06	12.16

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:06   12.16

COMMENTS: 02 TRAVERSE
NORTH PORT

POLK POWER STATION BACT TEST #4 04-17-2000

	CHAN 5
	STACK
TIME	%02
10:14	12.26
10:15	12.26
10:16	12.24
10:17	12.25
10:18	12.24
10:19	12.23
10:20	12.22
10:21	12.23
10:22	12.23
10:23	12.23
10:24	12.22
10:25	12.23

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:25 12.24

COMMENTS: 02 TRAVERSE
SOUTH PORT

POLK POWER STATION BACT TEST #4   04-17-2000

TIME	CHAN 5 STACK %O2
10:29	12.24
10:30	12.23
10:31	12.21
10:32	12.19
10:33	12.18
10:34	12.20
10:35	12.20
10:36	12.22
10:37	12.24
10:38	12.26
10:39	12.27
10:40	12.27

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:40 12.22

COMMENTS: O2 TRAVERSE
WEST PORT

Test Run ~~4~~ 1 STRATA Version 1.2.1

Begin calculating run averages

		O2	NOx
		%	ppm
04-17-2000	11:23:02	12.108	26.93
04-17-2000	11:24:01	12.107	26.84
04-17-2000	11:25:01	12.103	26.89
04-17-2000	11:26:02	12.107	26.86
04-17-2000	11:27:01	12.100	26.81
04-17-2000	11:28:02	12.094	26.76
04-17-2000	11:29:02	12.082	26.78
04-17-2000	11:30:01	12.090	26.76
04-17-2000	11:31:02	12.093	26.69
04-17-2000	11:32:02	12.086	26.65
04-17-2000	11:33:01	12.089	26.72
04-17-2000	11:34:02	12.083	26.70
04-17-2000	11:35:01	12.091	26.76
04-17-2000	11:36:01	12.084	26.63
04-17-2000	11:37:02	12.076	26.52
04-17-2000	11:38:01	12.069	26.52
04-17-2000	11:39:02	12.067	26.51
04-17-2000	11:40:01	12.083	26.50
04-17-2000	11:41:01	12.081	26.58
04-17-2000	11:42:02	12.093	26.50
04-17-2000	11:43:01	12.078	26.59
04-17-2000	11:44:02	12.071	26.54
04-17-2000	11:45:02	12.063	26.57
04-17-2000	11:46:01	12.071	26.59
04-17-2000	11:47:02	12.085	26.41
04-17-2000	11:48:02	12.076	26.52
04-17-2000	11:49:01	12.083	26.55
04-17-2000	11:50:02	12.078	26.62
04-17-2000	11:51:02	12.082	26.62
04-17-2000	11:52:01	12.089	26.84
04-17-2000	11:53:02	12.089	27.12
04-17-2000	11:54:01	12.089	26.92
04-17-2000	11:55:02	12.094	26.75
04-17-2000	11:56:02	12.074	26.60
04-17-2000	11:57:01	12.071	26.50
04-17-2000	11:58:02	12.079	26.60
04-17-2000	11:59:02	12.085	26.72
04-17-2000	12:00:01	12.079	26.86
04-17-2000	12:01:02	12.084	26.86
04-17-2000	12:02:01	12.086	26.87
04-17-2000	12:03:01	12.092	27.02
04-17-2000	12:04:02	12.093	27.10
04-17-2000	12:05:01	12.093	27.32
04-17-2000	12:06:02	12.098	27.54
04-17-2000	12:07:02	12.109	27.55
04-17-2000	12:08:01	12.117	27.28
04-17-2000	12:09:02	12.092	27.04
04-17-2000	12:10:02	12.093	26.90
04-17-2000	12:11:01	12.071	26.92
04-17-2000	12:12:02	12.090	26.91
04-17-2000	12:13:01	12.094	26.96
04-17-2000	12:14:01	12.081	26.88

Test Run ~~4~~ 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 12:15:02	12.070	26.87
04-17-2000 12:16:01	12.066	26.81
04-17-2000 12:17:01	12.074	26.91
04-17-2000 12:18:02	12.077	26.91
04-17-2000 12:19:01	12.078	26.81
04-17-2000 12:20:02	12.079	26.90
04-17-2000 12:21:02	12.093	26.92
04-17-2000 12:22:01	12.087	27.00
Run Averages	O2	NOx
	%	ppm
04-17-2000 12:22:01	12.086	26.80

Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG
Test Run ~~4~~ 1 End

Test Run ~~8~~ 2 STRATA Version 1.2.1

	O2 %	NOx ppm
Begin calculating run averages		
04-17-2000 12:28:01	3.832	51.97
04-17-2000 12:29:01	11.984	27.92
04-17-2000 12:30:01	12.005	27.48
04-17-2000 12:31:00	12.025	27.61
04-17-2000 12:32:01	12.027	27.72
04-17-2000 12:33:01	12.057	27.61
04-17-2000 12:34:00	12.049	27.57
04-17-2000 12:35:01	12.045	27.35
04-17-2000 12:36:01	12.036	27.29
04-17-2000 12:37:00	12.035	27.26
04-17-2000 12:38:01	12.044	27.30
04-17-2000 12:39:01	12.042	27.45
04-17-2000 12:40:01	12.045	27.56
04-17-2000 12:41:00	12.052	27.86
04-17-2000 12:42:01	12.048	27.69
04-17-2000 12:43:01	12.059	27.76
04-17-2000 12:44:01	12.070	27.81
04-17-2000 12:45:01	12.071	27.87
04-17-2000 12:46:00	12.057	27.94
04-17-2000 12:47:00	12.056	27.83
04-17-2000 12:48:01	12.057	27.76
04-17-2000 12:49:01	12.050	27.87
04-17-2000 12:50:01	12.065	27.77
04-17-2000 12:51:00	12.061	27.79
04-17-2000 12:52:01	12.059	27.82
04-17-2000 12:53:01	12.057	27.77
04-17-2000 12:54:00	12.047	27.76
04-17-2000 12:55:01	12.037	27.71
04-17-2000 12:56:01	12.045	27.61
04-17-2000 12:57:01	12.044	27.70
04-17-2000 12:58:00	12.064	27.79
04-17-2000 12:59:01	12.061	27.88
04-17-2000 13:00:01	12.061	28.00
04-17-2000 13:01:01	12.049	27.85
04-17-2000 13:02:00	12.050	27.66
04-17-2000 13:03:01	12.058	27.82
04-17-2000 13:04:01	12.069	27.79
04-17-2000 13:05:01	12.063	27.84
04-17-2000 13:06:00	12.070	27.79
04-17-2000 13:07:01	12.070	27.81
04-17-2000 13:08:01	12.059	27.78
04-17-2000 13:09:01	12.060	27.71
04-17-2000 13:10:00	12.062	27.75
04-17-2000 13:11:01	12.060	27.63
04-17-2000 13:12:01	12.082	27.70
04-17-2000 13:13:00	12.081	27.78
04-17-2000 13:14:01	12.078	27.71
04-17-2000 13:15:01	12.085	27.67
04-17-2000 13:16:01	12.073	27.70
04-17-2000 13:17:00	12.080	27.79
04-17-2000 13:18:01	12.086	28.02
04-17-2000 13:19:01	12.104	27.95

2 DS
Test Run ~~5~~ STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 13:20:01	12.087	27.76
04-17-2000 13:21:01	12.053	27.55
04-17-2000 13:22:00	12.031	27.29
04-17-2000 13:23:01	12.030	27.38
04-17-2000 13:24:01	12.032	27.37
04-17-2000 13:25:00	12.042	27.49
04-17-2000 13:26:01	12.047	27.65
04-17-2000 13:27:01	11.843	29.83
Run Averages	O2	NOx
	%	ppm
04-17-2000 13:27:01	11.911	28.14

Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG
Test Run ~~5~~ 2 End

Test Run ~~6~~ 3 DB STRATA Version 1.2.1

	O2 %	NOx ppm
Begin calculating run averages		
04-17-2000 13:34:02	12.021	28.54
04-17-2000 13:35:01	12.030	28.28
04-17-2000 13:36:01	12.030	28.24
04-17-2000 13:37:02	12.044	28.41
04-17-2000 13:38:01	12.055	28.47
04-17-2000 13:39:01	12.073	28.45
04-17-2000 13:40:01	12.067	28.35
04-17-2000 13:41:01	12.069	28.21
04-17-2000 13:42:02	12.064	28.00
04-17-2000 13:43:01	12.069	28.24
04-17-2000 13:44:02	12.068	28.12
04-17-2000 13:45:02	12.059	27.88
04-17-2000 13:46:01	12.051	28.01
04-17-2000 13:47:01	12.054	28.13
04-17-2000 13:48:01	12.046	27.97
04-17-2000 13:49:02	12.040	27.84
04-17-2000 13:50:01	12.041	27.80
04-17-2000 13:51:01	12.054	27.92
04-17-2000 13:52:02	12.060	27.89
04-17-2000 13:53:02	12.059	27.82
04-17-2000 13:54:01	12.055	27.69
04-17-2000 13:55:01	12.060	27.74
04-17-2000 13:56:02	12.080	27.82
04-17-2000 13:57:01	12.075	27.91
04-17-2000 13:58:01	12.076	27.77
04-17-2000 13:59:01	12.088	27.79
04-17-2000 14:00:02	12.067	27.61
04-17-2000 14:01:01	12.065	27.48
04-17-2000 14:02:01	12.048	27.51
04-17-2000 14:03:02	12.053	27.54
04-17-2000 14:04:02	12.052	27.54
04-17-2000 14:05:01	12.062	27.59
04-17-2000 14:06:01	12.068	27.76
04-17-2000 14:07:02	12.081	27.84
04-17-2000 14:08:02	12.066	27.79
04-17-2000 14:09:01	12.075	27.85
04-17-2000 14:10:01	12.075	27.84
04-17-2000 14:11:01	12.077	27.79
04-17-2000 14:12:02	12.087	27.76
04-17-2000 14:13:01	12.090	27.69
04-17-2000 14:14:01	12.082	27.62
04-17-2000 14:15:01	12.063	27.49
04-17-2000 14:16:02	12.075	27.51
04-17-2000 14:17:01	12.062	27.48
04-17-2000 14:18:01	12.071	27.40
04-17-2000 14:19:02	12.065	27.37
04-17-2000 14:20:02	12.067	27.32
04-17-2000 14:21:01	12.059	27.44
04-17-2000 14:22:01	12.069	27.45
04-17-2000 14:23:02	12.063	27.34
04-17-2000 14:24:02	12.078	27.42
04-17-2000 14:25:01	12.067	27.42

3 PB ✓

Test Run ~~6~~ STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 14:26:01	12.053	27.35
04-17-2000 14:27:01	12.058	27.38
04-17-2000 14:28:02	12.081	27.32
04-17-2000 14:29:01	12.087	27.33
04-17-2000 14:30:01	12.079	27.34
04-17-2000 14:31:02	12.074	27.34
04-17-2000 14:32:02	12.083	27.37
04-17-2000 14:33:01	12.101	26.38
Run Averages	O2	NOx
	%	ppm
04-17-2000 14:33:02	12.065	27.73

Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: 3 UNIT 1 HRSG
Test Run ~~6~~ End

APPENDIX D

SAMPLING EQUIPMENT CALIBRATIONS

APPENDIX D-1 LINEARITY CALIBRATIONS

APPENDIX D-2 DRIFT ASSESSMENT CALS

APPENDIX D-3 CYLINDER GAS CERTIFICATION

APPENDIX D-4 CONVERTER EFFICIENCY RESULTS

APPENDIX D-1

LINEARITY CALIBRATIONS

Calibration Error Test, Run ~~4~~ 1 pB STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 09:16:37	16.829	12.50
04-17-2000 09:17:37	20.893	0.30
04-17-2000 09:18:38	17.847	11.86
04-17-2000 09:19:37	11.935	0.46
04-17-2000 09:20:38	10.208	16.27
04-17-2000 09:21:37	0.101	79.75
04-17-2000 09:22:38	0.039	79.93
04-17-2000 09:23:38	0.763	52.39
04-17-2000 09:24:37	0.438	41.16
04-17-2000 09:26:02	-0.016	24.71

Calibration Error Test at Run ~~4~~ 1

Operator: DAVID SMITH

Plant Name: POLK POWER STATION

Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2	ALM017445		ALM031884	
NOx		ALM0245301	ALM017813	ALM020566

Date/Time	04-17-2000		09:26:04	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Avg	0.046	0.28		
Zero Error%	0.2%	0.3%		
Low Ref Cyl		24.90		
Low Avg		24.70		
Low Error%		0.2%		
Mid Ref Cyl	11.960	49.47		
Mid Avg	12.046	47.58		
Mid Error%	0.3%	1.9%		
High Ref Cyl	20.900	81.82		
High Avg	20.902	80.08		
High Error%	0.0%	1.7%		

Calibration Error Test End

APPENDIX D-2

DRIFT ASSESSMENT CALS

Initial System Bias Check, Run ~~4~~ 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 09:27:17	18.669	3.51
04-17-2000 09:28:17	11.930	0.91
04-17-2000 09:29:17	6.859	12.26
04-17-2000 09:30:16	0.023	24.57

Initial System Bias Check for Run ~~4~~ 1

Operator: DAVID SMITH

Plant Name: POLK POWER STATION

Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Span
O2	ALM017445	ALM031884
NOx		ALM0245301

Date/Time	04-17-2000		09:30:55	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Cal	0.046	0.28		
Zero Avg	0.019	0.91		
Zero Bias%	0.1%	0.6%		
Zero Drift%				
Span Ref Cyl	11.960	24.90		
Span Cal	12.046	24.70		
Span Avg	11.960	24.57		
Span Bias%	0.3%	0.1%		
Span Drift%				

System Bias Check End

Final System Bias Check, Run ~~4~~ 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 12:23:03	11.753	15.48
04-17-2000 12:24:02	11.990	3.61
04-17-2000 12:25:02	10.693	6.35
04-17-2000 12:26:03	0.024	26.73

Final System Bias Check for Run ~~4~~ 1

Operator: DAVID SMITH

Plant Name: POLK POWER STATION

Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Span
O2	ALM017445	ALM031884
NOx		ALM0245301

Date/Time	04-17-2000	12:26:42	PASSED
Analyte	O2	NOx	
Units	%	ppm	
Zero Ref Cyl	0.000	0.00	
Zero Cal	0.046	0.28	
Zero Avg	-0.015	3.56	
Zero Bias%	0.2%	3.3%	
Zero Drift%	-0.1%	2.6%	
Span Ref Cyl	11.960	24.90	
Span Cal	12.046	24.70	
Span Avg	11.996	27.25	
Span Bias%	0.2%	2.5%	
Span Drift%	0.1%	2.7%	
Ini Zero Avg	0.019	0.91	
Ini Span Avg	11.960	24.57	
Run Avg	12.086	26.80	
Co	0.002	2.23	
Cm	11.978	25.91	
Correct Avg	12.068	25.84	

System Bias Check End

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

RUN NUMBER: 1

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	ANALYZER CAL. RESPONSE	-----INITIAL VALUES----- SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	-----FINAL VALUES----- SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.9	0.3	-0.63	3.6	2.65	3.28
NOx UP-SCALE	24.6	24.6	0.00	27.3	2.68	2.68
O2 LOW GAS	0.05	0.02	-0.12	-0.02	-0.28	-0.16
O2 UP-SCALE	11.96	11.96	0.00	12.00	0.14	0.14

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

RUN NUMBER: 1

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.02	0.02	0.00	-0.02	-0.16	-0.16
O2 UP-SCALE	11.96	11.96	0.00	12.00	0.14	0.14

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

Final System Bias Check, Run ~~3~~ 2 STRATA Version 1.2.1

		O2	NOx
		%	ppm
04-17-2000	13:28:02	10.916	9.04
04-17-2000	13:29:02	11.972	4.37
04-17-2000	13:30:02	11.980	4.33
04-17-2000	13:31:02	7.893	13.05
04-17-2000	13:32:02	-0.067	27.80

Final System Bias Check for Run ~~3~~ 2
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

	Reference Cylinder Numbers	
	Zero	Span
O2	ALM017445	ALM031884
NOx		ALM0245301

Date/Time	04-17-2000		13:32:48	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Cal	0.046	0.28		
Zero Avg	0.037	4.32		
Zero Bias%	0.0%	4.0%		
Zero Drift%	0.2%	0.8%		
Span Ref Cyl	11.960	24.90		
Span Cal	12.046	24.70		
Span Avg	11.980	27.61		
Span Bias%	0.3%	2.9%		
Span Drift%	-0.1%	0.4%		
Ini Zero Avg	-0.015	3.56		
Ini Span Avg	11.996	27.25		
Run Avg	11.911	28.14		
Co	0.011	3.94		
Cm	11.988	27.43		
Correct Avg	11.884	25.66		

System Bias Check End

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

RUN NUMBER: 2

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	INITIAL VALUES			FINAL VALUES		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.9	3.6	2.65	4.3	3.41	0.76
NOx UP-SCALE	24.6	27.3	2.68	27.6	3.04	0.36
O2 LOW GAS	0.05	-0.02	-0.28	0.04	-0.05	0.23
O2 UP-SCALE	11.96	12.00	0.14	11.98	0.08	-0.06

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

RUN NUMBER: 2

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.02	-0.02	-0.16	0.04	0.07	0.23
O2 UP-SCALE	11.96	12.00	0.14	11.98	0.08	-0.06

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

Final System Bias Check, Run ~~6~~ 3 STRATA Version 1.2.1

	O2	NOx
	%	ppm
04-17-2000 14:34:03	10.875	7.79
04-17-2000 14:35:03	12.027	4.15
04-17-2000 14:36:03	6.905	14.84
04-17-2000 14:37:20	0.023	27.44

Final System Bias Check for Run 6
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Span
O2	ALM017445	ALM031884
NOx		ALM0245301

Date/Time	04-17-2000		14:37:20	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Cal	0.046	0.28		
Zero Avg	0.068	4.14		
Zero Bias%	0.1%	3.9%		
Zero Drift%	0.1%	-0.2%		
Span Ref Cyl	11.960	24.90		
Span Cal	12.046	24.70		
Span Avg	12.027	27.49		
Span Bias%	0.1%	2.8%		
Span Drift%	0.2%	-0.1%		
Ini Zero Avg	0.037	4.32		
Ini Span Avg	11.980	27.61		
Run Avg	12.065	27.73		
Co	0.053	4.23		
Cm	12.003	27.55		
Correct Avg	12.021	25.10		

System Bias Check End

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

RUN NUMBER: 3

SPAN VALUES: 100 ppm NOx
25 % Oxygen

		INITIAL VALUES		FINAL VALUES		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.9	4.3	3.41	4.1	3.23	-0.18
NOx UP-SCALE	24.6	27.6	3.04	27.5	2.92	-0.12
O2 LOW GAS	0.05	0.04	-0.05	0.07	0.07	0.12
O2 UP-SCALE	11.96	11.98	0.08	12.03	0.27	0.19

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 4/17/00

RUN NUMBER: 3

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.02	0.04	0.07	0.07	0.19	0.12
O2 UP-SCALE	11.96	11.98	0.08	12.03	0.27	0.19

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

APPENDIX D-3

CYLINDER GAS CERTIFICATION

CES BILL 1

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N31923
Project No.: 12-33126-001

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM020393 **Certification Date:** 3/11/99 **Exp. Date:** 3/11/2002

Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	11.96 %	+/- 1%	NIST
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658	1/02/01	ALM031884	9.680 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/16804-02	02/22/99	GC / TCD

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

OXYGEN

First Triad Analysis	Second Triad Analysis	Calibration Curve
Date: 03/11/99 Response Unit: AREA		Concentration = A + Bx + Cx2 + Dx3 + Ex4
Z1 = 0.0000 R1 = 247696 T1 = 306452		r = 0.99999
R2 = 248148 Z2 = 0.0000 T2 = 306564		Constants: A = 0.00
Z3 = 0.0000 T3 = 306567 R3 = 248251		B = 1.00 C = 0.00
Avg. Concentration: 11.96 %		D = 0.00 E = 0.00

Special Notes:

APPROVED BY: B. M. Becton
B.M. BECTON

ATTACHMENT 1

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: E-N31293
Project No.: 12-32332-014

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM045301 Certification Date: 2/08/99 Exp. Date: 2/07/2001
Cylinder Pressure***: 1940 PSIG

COMPONENT	CERTIFIED CONCENTRATION		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	24.0	PPM	+/- 1%	NIST
NITROGEN - OXYGEN FREE		BALANCE		
NOX	24.9	BALANCE		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	4/09/99	ALM067006	21.48 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/CLA53A/850658093	02/08/99	CHEMILUMINESCENT

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date: 02/01/99	Response Unit: PPM	
Z1=0.0500	R1=21.580	T1=24.100
R2=21.510	Z2=0.0300	T2=23.990
Z3=0.0300	T3=24.010	R3=21.520
Avg. Concentration:	23.97	PPM

Second Triad Analysis

Date: 02/08/99	Response Unit: PPM	
Z1=0.1900	R1=21.400	T1=24.050
R2=21.410	Z2=0.1600	T2=24.040
Z3=0.1600	T3=24.010	R3=21.410
Avg. Concentration:	24.09	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

Special Notes:

APPROVED BY: Greg T Bartett
G BARTNETT

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N75516
Project No.: 12-36341-002

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM017813 Certification Date: 10/29/99 Exp. Date: 10/28/2001
Cylinder Pressure***: 1912 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	48.56	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	49.47	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	10/22/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis | Second Triad Analysis | Calibration Curve

NITRIC OXIDE

Date:10/22/99	Response Unit:PPM	
Z1=-0.01310	R1=48.79556	T1=48.39187
R2=48.89616	Z2=0.16660	T2=48.61919
Z3=0.08300	T3=48.62870	R3=49.00827
Avg. Concentration:	48.55	PPM

Date: 10/29/99	Response Unit: PPM	
Z1=0.14850	R1=49.06593	T1=48.55658
R2=48.76309	Z2=0.12020	T2=48.59997
Z3=0.04920	T3=48.54071	R3=48.87097
Avg. Concentration:	48.57	PPM

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

APPROVED BY: BMB
B.M. Becton

RATA CLASS (ES-HARD-3

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory		Customer
	P.O. No.: N31923	TAMPA ELECTRIC CO
SCOTT SPECIALTY GASES	Project No.: 12-35046-001	
1750 EAST CLUB BLVD		5010 CAUSEWAY BLVD
DURHAM,NC 27704		TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM019127 Certification Date: 7/19/99 Exp. Date: 7/18/2001

Cylinder Pressure***: 1994 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)	ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	81.13 PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE	BALANCE		
TOTAL OXIDES OF NITROGEN	81.82 PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	07/15/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis | Second Triad Analysis | Calibration Curve

NITRIC OXIDE

Date:07/12/99	Response Unit:PPM	
Z1=0.1222	R1=48.911	T1=80.909
R2=48.792	Z2=-0.077	T2=81.157
Z3=0.1565	T3=81.343	R3=48.996
Avg. Concentration:	81.14	PPM

Date: 07/19/99	Response Unit: PPM	
Z1=0.2335	R1=48.805	T1=81.051
R2=48.938	Z2=-0.005	T2=81.173
Z3=0.1145	T3=81.120	R3=48.957
Avg. Concentration:	81.11	PPM

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

APPROVED BY: [signature]

B.M. Becton

APPENDIX D-4

CONVERTER EFFICIENCY RESULTS

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

TO: Quality Assurance File

FROM: R.A. Mc Darby

DATE: 18, April, 2000

SUBJECT: NO2 to NO Converter Efficiency Test
40 CFR 60, Appendix A, Method 20
Section 5.6
Analyzer S/N 10A/R-19785-186

The following results detail the performance of the converter efficiency test on analyzer S/N 10A/R-19785-186:

Highest value recorded during the 30 minute test run =	38.4 ppm
Value recorded at the end of the 30 minute test run =	38.3 ppm
Percent of decrease =	0.3 %

These results indicate that the converter currently installed in the referenced analyzer meets the requirements of 40 CFR 60, Appendix A, Reference Method 20, § 5.6.

In accordance with the instructions contained in 40 CFR 60, Appendix A, Reference Method 20, sub-section 5.6.1; A sample was prepared using gas cylinder S/N ALM-017813 (certificate attached), diluted approximately 1:1 with 20.9% purified air. The sample was introduced into the analyzer through the sample port, and allowed to run for 30 minutes (10:46 – 11:16). The results from this run are attached for reference.

RAM Darby

Raymond A. Mc Darby
Senior Environmental Technician
Corporate Environmental Services
Air & Audit Services

POLK POWER STATION BACT TEST #4 04-17-2000

TIME	CHAN 3 INLET ppmNOX
10:47	37.5
10:48	37.7
10:49	37.8
10:50	37.8
10:51	37.9
10:52	37.9
10:53	38.0
10:54	38.0
10:55	38.1
10:56	38.1
10:57	34.5
10:58	35.0
10:59	38.3
11:00	38.3
11:01	38.3
11:02	38.3
11:03	38.3
11:04	38.4
11:05	38.4
11:06	38.4
11:07	38.4
11:08	38.4
11:09	38.4
11:10	38.3
11:11	38.4
11:12	38.3
11:13	38.3
11:14	38.3
11:15	38.3
11:16	38.3

NO mode

AVERAGE VALUES FOR THE LAST 30 MINUTES

11:16	38.0

COMMENTS: END CONVERTER EFFICIENCY TEST

38.2 ppm on 28 points.

APPENDIX E

PROJECT PARTICIPANTS

TEST PARTICIPANTS

Corporate Environmental Services

Robert Barthelette, Jr.	Environmental Technician
David Smith	Senior Environmental Technician

Polk Power Station

Tom Berry	Operations Manager

Best Available Copy

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
FAX (813) 272-5157

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

ENVIRONMENTAL PROTECTION COMMISSION of Hillsborough County

FAX Transmittal Sheet

DATE: 4/10/00

TO: Syed Arif

FAX Phone: ____ Voice Phone: 8-278-1344

TOTAL NUMBER OF PAGES INCLUDING THIS COVER PAGE: 3

EPC FAX Transmission Line: (813) 272-5605
For retransmission or any FAX problems, call: (813) 272-5530

FROM: Rob Kalch
(Circle applicable section below)

Air Division

-Compliance -Enforcement/Analysis

-Monitoring/Toxics -Permitting

SPECIAL INSTRUCTIONS:

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL &
WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
FAX (813) 272-5157

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

MEMORANDUM

DATE: April 10, 2000

TO: Syed Arif

FROM: Rob Kalch RK

SUBJECT: **Polk Power Plant - BACT Determination Review Test #3**

As you know I have been reviewing the results of the BACT Determination tests for the Polk Power Station. I have received the latest test results for the test performed February 7, 2000. I have reviewed them and the same problems still persist in my analysis. I have outlined my concerns in the questions below.

1. What is the average volumetric gas flowrate exiting the stacks during each test? This is necessary to properly evaluate the plant's performance. The concentrations TEC has provided are only half the picture. The mass of NO_x emitted to the atmosphere cannot be properly evaluated without the exhaust gas flowrate.

2. I have spoken with James Hunter at TEC and was told TEC uses an algorithm to calculate the volumetric gas flowrate out of the stacks. What is the algorithm, and have the results of this algorithm been verified?

3. What are the parameters of the "syngas" which TEC has burned during the tests? The construction permit application received by us on May 14, 1999 contains parameters for the consumption of natural gas. The test reports are clear that "syngas" is being used. Is this a typo or the same gaseous fuel being referred to by different names?

4. Concerning the nitrogen flowrate listed in the reports. Where is this flowrate measured at, and on which gas stream?

5. Lastly, does TEC have any explanation for the higher than expected concentrations of NO_x emitted from the facility? Table 5.19, Proposed BACT Emission Limits, in the Simple-Cycle Combustion Turbines Air Construction Permit Application received in April of 1999, proposes a corrected concentration of 10.5 ppm be set as the limit while firing natural gas. The tests

indicate that the facility has not met this proposed concentration limit during the tests in October, December, or February.

Please pass these questions along to TEC. The answers to these questions are necessary to properly evaluate the results of the BACT Determination Tests. EPC does appreciate the opportunity extended to us to review this project because of the proximity to Hillsborough County, and hopes to continue to assist with the evaluation of this facility.

rsk

TECO

TAMPA ELECTRIC

April 6, 2000

Mr. Syed Arif
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7908 2853 0947

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via FedEx
Airbill No. 7910 6813 3060

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petroleum Coke Test Burn
Permit No. 1050233-002-AC, PSD-FL-194
Notification of Stack Test

Dear Mr. Arif and Mr. Proses:

TEC was scheduled to perform the second portion of the petroleum coke blend emissions stack test at Polk Power Station on April 4 - 5, 2000. Due to a schedule conflict the stack test has been rescheduled to April 19 and April 20, 2000.

Should you have any questions, please feel free to contact me at (813) 641-5034.

Sincerely,

Linda M. Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK125

c: Mr. Howard Rhodes - FDEP
Mr. Buck Oven - FDEP
Mr. Bill Thomas - FDEP SWD
Mr. Gerald Kissel - FDEP SWD

TECO
TAMPA ELECTRIC

RECEIVED
APR 13 2000
BUREAU OF AIR REGULATION

April 12, 2000

Mr. Syed Arif
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7908 3050 6736

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via FedEx
Airbill No. 7908 3050 7879

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petroleum Coke Test Burn
Permit No. 1050233-002-AC, PSD-FL-194
Notification of Postponement

Dear Mr. Arif and Mr. Proses:

TEC was scheduled to perform the second portion of the petroleum coke blend emissions stack test at Polk Power Station on April 19-20, 2000. Due to an unscheduled outage the stack test has been postponed until further notice.

Should you have any questions, please feel free to contact me at (813) 641-5034.

Sincerely,

Linda M. Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK127

c: Mr. Howard Rhodes - FDEP
Mr. Buck Oven - FDEP
Mr. Bill Thomas - FDEP SWD
Mr. Gerald Kissel - FDEP SWD

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Gregory M. Nelson, PE
TECO
PO Box 111
Tampa, Fl
33601-0111

COMPLETE THIS SECTION ON DELIVERY

A. Received by *(Please Print Clearly)*

B. Date of Delivery APR 13

C. Signature

X

☐ Agent
☐ Addressee

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

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

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

2. Article Number *(Copy from service label)* Z 031 391 940

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

Z 031 391 940

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

Sent to	Greg. Nelson
Street & Number	TECO
Post Office, State, & ZIP Code	Tampa Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	Nox ACT
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	Polk Power St. Unit 1 4-11-00

PS Form **3800**, April 1995

Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

April 11, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Director – Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: NO_x BACT Determination Test
Polk Power Station Unit 1

Dear Mr. Nelson:

The Department is in receipt of the third NO_x BACT Determination Test on the combustion turbine at the above referenced facility. The test was performed on February 7, 2000. Enclosed for your review are the issues raised by the Environmental Protection Commission of the Hillsborough County. Please respond to their concerns at your earliest.

If there are any questions on the issues raised, please do not hesitate to contact Mr. Rob Kalch at 813-272-5530.

Sincerely,

A A L ,/,,

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

AAL/sa

cc: Bill Thomas, DEP-SWD
Jerry Campbell, HCEPC

COMMISSION
PAT FRANK
CHRIS HART
JIM NORMAN
JAN PLATT
THOMAS SCOTT
RONDA STORMS
BEN WACKSMAN

EXECUTIVE DIRECTOR
ROGER P. STEWART

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
FAX (813) 272-5157

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

MEMORANDUM

DATE: April 10, 2000

TO: Syed Arif

FROM: Rob Kalch RK

SUBJECT: **Polk Power Plant - BACT Determination Review Test #3**

As you know I have been reviewing the results of the BACT Determination tests for the Polk Power Station. I have received the latest test results for the test performed February 7, 2000. I have reviewed them and the same problems still persist in my analysis. I have outlined my concerns in the questions below.

1. What is the average volumetric gas flowrate exiting the stacks during each test? This is necessary to properly evaluate the plant's performance. The concentrations TEC has provided are only half the picture. The mass of NO_x emitted to the atmosphere cannot be properly evaluated without the exhaust gas flowrate.

2. I have spoken with James Hunter at TEC and was told TEC uses an algorithm to calculate the volumetric gas flowrate out of the stacks. What is the algorithm, and have the results of this algorithm been verified?

3. What are the parameters of the "syngas" which TEC has burned during the tests? The construction permit application received by us on May 14, 1999 contains parameters for the consumption of natural gas. The test reports are clear that "syngas" is being used. Is this a typo or the same gaseous fuel being referred to by different names?

4. Concerning the nitrogen flowrate listed in the reports. Where is this flowrate measured at, and on which gas stream?

5. Lastly, does TEC have any explanation for the higher than expected concentrations of NO_x emitted from the facility? Table 5.19, Proposed BACT Emission Limits, in the Simple-Cycle Combustion Turbines Air Construction Permit Application received in April of 1999, proposes a corrected concentration of 10.5 ppm be set as the limit while firing natural gas. The tests

indicate that the facility has not met this proposed concentration limit during the tests in October, December, or February.

Please pass these questions along to TEC. The answers to these questions are necessary to properly evaluate the results of the BACT Determination Tests. EPC does appreciate the opportunity extended to us to review this project because of the proximity to Hillsborough County, and hopes to continue to assist with the evaluation of this facility.

rsk

(P.E.) registered in Florida. Please indicate who was the P.E. in the project participant's list provided with the test report.

The Department will review future Emissions Test Report for different blends of petcoke/coal in a similar fashion. Any additional comments from EPA and U.S. Fish and Wildlife Service will be forwarded to you after we receive them. If there are any questions regarding this matter, please call Syed Arif, P.E. at (850)921-9528.

Sincerely,

A.A. Linero 4/10

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

AAL/sa

cc: Buck Oven, DEP
Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

April 10, 2000

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Director – Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Petcoke Test Burn Report
Polk Power Station Unit 1

Dear Mr. Nelson:

The Department has received on March 30, 2000 the Emissions Test Report for pollutant emissions of the above referenced unit while firing syngas produced from blends of 40 percent petroleum coke (petcoke) and 60 percent coal. Based on our review of the report, the Department would like to bring your attention to certain important findings and deficiencies of the Emissions Test Report. They are as follows:

1. Unit 1 was originally permitted for 260 MW. The baseline testing was conducted while the unit was producing 191 MW average and the blend testing was done while the unit was producing 183 MW average. Specific condition 19 of the permit modification, authorizing petcoke blend testing, states that any subsequent source operation with a petcoke-coal blend syngas, if requested and approved by the Department, shall be limited to 110 percent of the tested capacity for that blend syngas until new tests are conducted, which requires prior Department authorization. Therefore, future operation of the unit at 40% petcoke/60% coal blend will be limited to 110 percent of 183 MW.
2. The Sulfuric Acid Mist (H_2SO_4) emissions rate for the baseline test were determined to be 31.12 lb/hr, while for the blend test, emissions were 33.35 lb/hr (~ 34.8 lb/hr@191 MW). The difference translates to more than 9 tons per year (TPY) increase of H_2SO_4 (16.2 TPY@191 MW). The Prevention of Significant Deterioration (PSD) review is triggered for H_2SO_4 for emissions increases of more then 7 TPY. Unless measures are undertaken to reduce H_2SO_4 emissions when firing petcoke, this pollutant will have to undergo PSD review for any future modification application to allow permanent firing of syngas produced from blends of petcoke/coal.
3. Specific Condition 16 of the permit modification required that the performance tests for pollutant emissions shall be conducted under the direct supervision of a professional engineer

Fold at line over top of envelope to

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Gregory M. Nelson, P.E.
TECO
PO Box 111
Tampa, Fl
33601-0111

COMPLETE THIS SECTION ON DELIVERY

A. Received by (Please ~~Print~~ Clearly)

B. Date of Delivery APR 12

C. Signature
X
☐ Agent
☐ Addressee

D. Is delivery address different from item 1? ☐ Yes
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☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

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2. Article Number (Copy from service label) Z 031 391 939

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

Z 031 391 939

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Return Receipt Showing to Whom, Date, & Addressee's Address	PPS Unit 1
TOTAL Postage & Fees	$
Postmark or Date	4-10-00

PS Form 3800, April 1995

TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
AIR PROGRAMS REPORT

PETCOKE FUEL EMISSIONS TEST

POLK POWER STATION
UNIT NO. 1

AIRS # 1050233

FEBRUARY 7, 2000 THRU FEBRUARY 15, 2000

TECO

TAMPA ELECTRIC

RECEIVED

MAY 01 2000

BUREAU OF AIR REGULATION

April 28, 2000

Mr. A.A. Linero, P.E.
Administrator
New Source Review Section
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Fl 32301

Via FedEx
Airbill No. 7910 7787 9077

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petcoke Test Burn Report
Response to Comment Letter

PSD-FL-194C

Dear Mr. Linero:

This letter is in response to the comments raised in your letter dated April 10, 2000 regarding TEC's initial petroleum coke (petcoke) test burn while firing syngas produced from blends of 40 percent petcoke and 60 percent coal. TEC hereby provides the following responses:

FDEP Comment 1:

Unit 1 was originally permitted for 260 MW. The baseline testing was conducted while the unit was producing 191 MW average and the blend testing was done while the unit was producing 183 MW average. Specific condition 19 of the permit modification, authorizing petcoke blend testing, states that any subsequent source operation with a petcoke-coal blend syngas, if requested and approved by the Department, shall be limited to 110 percent of the tested capacity for that blend syngas until new tests are conducted, which requires prior Department authorization. Therefore, future operation of the unit at 40% petcoke/60% coal blend will be limited to 110 percent of 183 MW.

TEC Response:

Polk Power Station Unit 1 is in fact permitted for 260 MW. However, TEC would like to clarify that the averaged megawatts reported in the above referenced Test Report (191 MW and 183 MW, baseline and blend test periods, respectively) are generation based on the combustion turbine only, not the net generation permitted. As an addendum to the Test Report, please include the net generation for the facility during the baseline and blend test periods (please refer to Attachments 1 and 2). Unit 1 was generating an average of 250 MW and 244 MW during the *baseline and blend test periods, respectively, which is within the 90-100 percent permitted capacity required by Condition 19.*

FDEP Comment 2:

The Sulfuric Acid Mist (H_2SO_4) emissions rate for the baseline test were determined to be 31.12 lb/hr, while for the blend test, emissions were 33.35 lb/hr (~ 34.8 lb/hr @ 191 MW). The difference translates to more than 9 tons per year (TPY) increase of H_2SO_4 (16.2 TPY @ 191 MW). The Prevention of Significant Deterioration (PSD) review is triggered for H_2SO_4 for emissions increases of more then 7 TPY. Unless measures are undertaken to reduce H_2SO_4 emissions when firing petcoke, this pollutant will have to undergo PSD review for any future modification application to allow permanent firing of syngas produced from blends of petcoke/coal.

TEC Response:

The Sulfuric Acid Mist (H_2SO_4) emissions rates for the baseline and blend tests were determined to be 0.005 lb/mmBtu (please refer to Table 2, Test Burn Report). The annual H_2SO_4 emissions rates were calculated to be 38.4 tons per year (based on permitted heat input and hours of operation). Since the emissions rates are the same for both tests, this suggests that there would not be a significant increase of H_2SO_4. Based on this analysis, H_2SO_4 emissions will not exceed the 7 TPY limit and will not have to undergo PSD review for any future modification application to allow permanent firing of syngas derived from a 40% petcoke and 60% coal blend.

FDEP Comment 3:

Specific Condition 16 of the permit modification required that the performance tests for pollutant emissions shall be conduct under the direct supervision of a professional engineer (P.E.) registered in Florida. Please indicate who was the P.E. in the project participant's list provided with the test report.

TEC Response:

Mr. Gregory M. Nelson, P.E. was inadvertently excluded in the project participant's list. Please find enclosed a revised Project Participants List for Appendix I (Attachment 3).

Should you have any questions, please feel free to contact Linda M. Kong or me at (813) 641-5034.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Director
Environmental Affairs

EP\gm\LMK129
Attachments

c: Syed Arif, FDEP (Att)
Buck Oven, FDEP (Att)
Bill Thomas, FDEP - SWD (Att)

CC: EPA
NPS

ATTACHMENT 1

Baseline

POLK POWER STATION DCS DATA

Date	Time	Fuel To Slurry Preparation	Combustion Turbine Output (MW)	Net Output Generation (MW)	Diluent N2 To Turbine (KSCFH)	Fuel Flow To Turbine (KSCFH)	Fuel LHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (MMBTU/Hr)	NOx Emissions (Lb/Hr)	NOx Emissions (lb/MMBTU)	SO2 Emissions (Lb/Hr)	SO2 Emissions (lb/MMBTU)	Opacity %
02/07/00	10:00	Kentucky 9	191.8	248.7	5793	6607	247.2	267.7	1768	173.264	0.098	247.52	0.140	0.6
02/07/00	11:00	Kentucky 9	191.8	249.1	5816.0	6622	247.5	268	1774	175.626	0.099	266.1	0.150	1.3
02/07/00	12:00	Kentucky 9	191.8	251.0	5838.0	6623	247.4	267.8	1774	177.4	0.100	301.58	0.170	1.9
02/07/00	13:00	Kentucky 9	191.8	250.2	5852.0	6626	246.8	267.1	1770	178.77	0.101	300.9	0.170	1.6
02/07/00	14:00	Kentucky 9	191.8	249.9	5865.0	6642	245.7	265.8	1765	180.03	0.102	335.35	0.190	2.1
02/07/00	15:00	Kentucky 9	191.8	251.8	5859.0	6655	245.2	265.1	1764	179.928	0.102	335.16	0.190	2.3
02/07/00	16:00	Kentucky 9	191.8	251.6	5852.0	6662	244.8	264.6	1762	181.486	0.103	334.78	0.190	2.9
02/07/00	17:00	Kentucky 9	191.8	252.4	5843.0	6650	245	264.8	1761	177.861	0.101	352.2	0.200	1.5
02/07/00	18:00	Kentucky 9	191.8	251.1	5836.0	6642	245.5	265.3	1762	174.438	0.099	352.4	0.200	1.6
02/07/00	19:00	Kentucky 9	191.8	250.8	5832.0	6633	245.4	265.1	1759	172.382	0.098	316.62	0.180	1.1
02/08/00	8:00	Kentucky 9	191.3	251.1	5816.0	6718	243.5	263.4	1770	141.6	0.080	460.2	0.260	0.9
02/08/00	9:00	Kentucky 9	190.0	250.7	5832.0	6682	243.8	263.8	1763	142.803	0.081	282.08	0.160	0.8
02/08/00	10:00	Kentucky 9	190.0	249.1	5872.0	6677	244.1	264.2	1764	142.884	0.081	299.88	0.170	1.2
02/08/00	11:00	Kentucky 9	190.0	249.2	5896.0	6679	244.2	264.4	1766	144.812	0.082	282.56	0.160	1
02/08/00	12:00	Kentucky 9	190.0	249.6	5917.0	6681	244	264.3	1766	150.11	0.085	264.9	0.150	0.8
02/08/00	13:00	Kentucky 9	190.1	249.5	5937.0	6685	243.3	263.5	1761	149.685	0.085	281.76	0.160	0.5
02/08/00	14:00	Kentucky 9	190.0	249.9	5938.0	6672	243.4	263.6	1759	151.274	0.086	281.44	0.160	0.9
02/08/00	15:00	Kentucky 9	189.9	249.4	5927.0	6658	241.7	264.1	1758	154.704	0.088	298.86	0.170	0.9
		Average	191.1	250.3	5862.3	6656	244.9	265.1	1765	164	0.093	311	0.176	1.3

ATTACHMENT 2

Blend

POLK POWER STATION DCS DATA

Date	Time	Fuel To Slurry Preparation	Combustion Turbine Output (MW)	Net Output Generation (MW)	Diluent N2 To Turbine (KSCFH)	Fuel Flow To Turbine (KSCFH)	Fuel LHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (MMBTU/Hr)	NOx Emissions (Lb/Hr)	NOx Emissions (lb/MMBTU)	SO2 Emissions (Lb/Hr)	SO2 Emissions (lb/MMBTU)	Opacity %
02/14/00	9:00	40% Pet Coke	185.1	241.3	5980.0	6465	245.7	264.5	1710	140.22	0.082	222.3	0.130	1.3
02/14/00	10:00	40% Pet Coke	185.1	243.9	5966.0	6457	246.4	265.2	1712	143.808	0.084	256.8	0.150	1.3
02/14/00	11:00	40% Pet Coke	185.0	244.6	5979.0	6453	247.3	266.2	1718	146.03	0.085	223.34	0.130	1.3
02/14/00	12:00	40% Pet Coke	185.0	245.5	5994.0	6450	247.0	265.9	1715	150.92	0.088	240.1	0.140	2.9
02/14/00	13:00	40% Pet Coke	185.1	246.1	5996.0	6441	247.5	266.4	1716	154.44	0.090	240.24	0.140	2.9
02/14/00	14:00	40% Pet Coke	184.8	246.1	6017.0	6436	247.6	266.4	1714	157.688	0.092	239.96	0.140	2.6
02/14/00	15:00	40% Pet Coke	185.0	245.8	6022.0	6436	247.7	266.6	1716	159.588	0.093	223.08	0.130	2.6
02/14/00	16:00	40% Pet Coke	184.9	245.9	5983.0	6421	248.2	267.0	1714	161.116	0.094	205.68	0.120	2.9
02/14/00	17:00	40% Pet Coke	185.0	245.7	5970.0	6412	248.5	267.3	1714	159.402	0.093	205.68	0.120	2.8
02/15/00	8:00	40% Pet Coke	183.3	245.7	5756.0	6545	242.8	261.1	1709	146.974	0.086	239.26	0.140	2.1
02/15/00	9:00	40% Pet Coke	182.1	244.2	5668.0	6515	242.5	260.9	1700	142.8	0.084	306	0.180	2.7
02/15/00	10:00	40% Pet Coke	182.0	242.8	5610.0	6516	242.4	260.9	1700	136	0.080	357	0.210	2.6
02/15/00	11:00	40% Pet Coke	181.9	242.9	5649.0	6526	242.5	261.1	1704	136.32	0.080	306.72	0.180	2.4
02/15/00	12:00	40% Pet Coke	180.3	243.0	5663.0	6476	242.8	261.5	1693	133.747	0.079	270.88	0.160	3.3
02/15/00	13:00	40% Pet Coke	180.1	240.8	5695.0	6459	243.0	261.7	1690	135.2	0.080	304.2	0.180	3.9
02/15/00	14:00	40% Pet Coke	179.9	240.3	5714.0	6448	243.2	261.9	1689	136.809	0.081	304.02	0.180	4.2
02/15/00	15:00	40% Pet Coke	180.0	240.6	5750.0	6443	243.0	261.8	1686	136.566	0.081	286.62	0.170	4.5
		Average	183.2	243.8	5847.8	6465	245.2	263.9	1706	146	0.085	261	0.153	2.7

ATTACHMENT 3

PROJECT PARTICIPANTS

Environmental Affairs

Gregory M. Nelson, P.E.	Director

Corporate Environmental Services

Robert Barthelette Jr.	Environmental Technician
Craig Coronado	Associate Technician
Raymond McDarby	Senior Environmental Technician
Glenn Naslund	Environmental Technician
Bruce Rodriguez	Technician
David Smith	Senior Environmental Technician

Environmental Planning

Linda Kong	Engineer Associate

Polk Power Station

David Knapp	Environmental And Safety Engineer
John McDaniel, P.E.	Senior Engineer
Preston Moore	IGCC Specialist

TECO
TAMPA ELECTRIC

April 17, 2000

Mr. Syed Arif
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7918 2408 9041

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via FedEx
Airbill No. 7910 7248 7532

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petroleum Coke Test Burn
Permit No. 1050233-002-AC, PSD-FL-194
Notification of Stack Test

Dear Mr. Arif and Mr. Proses:

TEC was scheduled to perform the second portion of the petroleum coke blend emissions stack test at Polk Power Station on April 19 - 20, 2000. Due to an unscheduled outage the stack test has been rescheduled to April 24 and April 25, 2000.

Should you have any questions, please feel free to contact me at (813) 641-5034.

Sincerely,

Linda M. Kong

Linda M. Kong
Associate Engineer
Environmental Planning

c: Mr. Howard Rhodes - FDEP
Mr. Buck Oven - FDEP
Mr. Bill Thomas - FDEP SWD
Mr. Gerald Kissel - FDEP SWD

TAMPA ELECTRIC

April 10, 2000

BUREAU OF AIR REGULATION
APR 13 2000
RECEIVED

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7903 3107 4783

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine Fourth Test Reschedule

Dear Mr. Fancy:

Due to an unscheduled outage, the fourth NO_x BACT Determination test has been postponed until later a later date. Once the new test date has been scheduled, you will be notified. If you have any questions, please feel free to contact me at (813) 641-5125.

Sincerely,

Shannon K. Todd
Engineer
Environmental Planning

EP\gm\SKT155

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Steve Pak - EPCHC

COMMISSION
PAT FRANK
CHRIS HART
JIM NORMAN
JAN PLATT
THOMAS SCOTT
RONDA STORMS
BEN WACKSMAN

EXECUTIVE DIRECTOR
ROGER P. STEWART

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL &
WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
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AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

RECEIVED
APR 13 2000
BUREAU OF AIR REGULATION

MEMORANDUM

DATE: April 10, 2000

TO: Syed Arif

FROM: Rob Kalch RSK

SUBJECT: **Polk Power Plant - BACT Determination Review Test #3**

As you know I have been reviewing the results of the BACT Determination tests for the Polk Power Station. I have received the latest test results for the test performed February 7, 2000. I have reviewed them and the same problems still persist in my analysis. I have outlined my concerns in the questions below.

1. What is the average volumetric gas flowrate exiting the stacks during each test? This is necessary to properly evaluate the plant's performance. The concentrations TEC has provided are only half the picture. The mass of NO_x emitted to the atmosphere cannot be properly evaluated without the exhaust gas flowrate.

2. I have spoken with James Hunter at TEC and was told TEC uses an algorithm to calculate the volumetric gas flowrate out of the stacks. What is the algorithm, and have the results of this algorithm been verified?

3. What are the parameters of the "syngas" which TEC has burned during the tests? The construction permit application received by us on May 14, 1999 contains parameters for the consumption of natural gas. The test reports are clear that "syngas" is being used. Is this a typo or the same gaseous fuel being referred to by different names?

4. Concerning the nitrogen flowrate listed in the reports. Where is this flowrate measured at, and on which gas stream?

5. Lastly, does TEC have any explanation for the higher than expected concentrations of NO_x emitted from the facility? Table 5.19, Proposed BACT Emission Limits, in the Simple-Cycle Combustion Turbines Air Construction Permit Application received in April of 1999, proposes a corrected concentration of 10.5 ppm be set as the limit while firing natural gas. The tests

indicate that the facility has not met this proposed concentration limit during the tests in October, December, or February.

Please pass these questions along to TEC. The answers to these questions are necessary to properly evaluate the results of the BACT Determination Tests. EPC does appreciate the opportunity extended to us to review this project because of the proximity to Hillsborough County, and hopes to continue to assist with the evaluation of this facility.

rsk

REPORT CERTIFICATION

I have calculated and compiled all data in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 3/29/00 Signature

Test Report Author
Senior Environmental Technician
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

The sampling and analysis performed for this report were carried out under my direction and I hereby certify that this test is authentic and accurate.

Date 3-29-00 Signature

Test Team Leader
Environmental Technician
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 3-29-00 Signature

Administrator
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

Petcoke Fuel Emissions Test
Polk Power Station
Unit No. 1
February 7, 2000 through February 15, 2000
Sulfuric Acid Mist, Sulfur Dioxide, Opacity
Oxides of Nitrogen and Fuel Analysis

Tampa Electric Company

March 27, 2000

3/29/00

Gregory M. Nelson, P.E.
Florida License No. 44078

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APPENDICES

TABLE OF CONTENTS (CONT.)

1.0 INTRODUCTION

Corporate Environmental Services, Air Services and Auditing group of Tampa Electric Company performed a series of emission tests during the Petcoke test burn on Unit No. 1 at the Polk Power Station. The emission tests were conducted to measure pollutant emissions while firing syngas that was gasified from a blend of Petcoke and coal.

The Florida Department of Environmental Protection issued a letter of authorization to Tampa Electric Company for these emission tests to be conducted at Polk Power Station Unit No. 1, (operating permit No. 1050233-001-AV, Airs # 1050233). The test burn authorization included a Baseline Test firing syngas that was gasified with 100% coal and a series of Fuel Blend Petcoke Tests (Blend Tests) firing syngas that was gasified from a fuel blend of up to 70% Petcoke.

The Baseline stack test was performed on February 7, 2000 and February 8, 2000. The Fuel Blend test of 40% Petcoke and 60% coal was performed on February 14, 2000 and February 15, 2000. Operational data during the baseline and fuel blend testing can be found in Appendix C.

Unit No. 1 is an integrated coal gasification combined cycle (IGCC) generating unit. The combustion turbine is normally fired with syngas. Nitrogen Oxides, Sulfur Dioxide and Opacity data were measured and recorded using Continuous Emission Monitoring System (CEMS) during the Baseline and Fuel Blend Tests. All emission tests were performed following the procedures and quality control guidelines given in 40 CFR 60 Appendix A -Test Methods.

The Sulfuric Acid Mist (H_2SO_4) emissions rate for the baseline test was derived from 8 test runs. The calculated average was 0.005 lbs/MMBtu. The ninth run was not completed due to turbine failure which resulted in the unit coming off line. The H_2SO_4 emissions rate for the blend test was also derived from 8 test runs. The calculated average was 0.005 lbs/MMBtu. The ninth run was removed from averaging as an outlier.

The sulfur dioxide (SO_2) emissions rate for the baseline test was derived from a 2-day daily CEMS average. The calculated average during the baseline test was 0.176 lbs/MMBtu. The sulfur dioxide (SO_2) emissions rate for the blend test was also derived from a 2-day daily CEMS average during the blend test period. The calculated average during the blend was 0.153 lbs/MMBtu.

The nitrogen oxides (NOx) emissions rate for the baseline test was derived from a 2-day daily CEMS average. The calculated average during the baseline test was 0.093 lbs/MMBtu. The nitrogen oxides (NOx) emissions rate for the blend test was also derived from a 2-day daily CEMS average during the blend test period. The calculated average during the blend was 0.085 lbs/MMBtu.

Both the SO_2 and NOx averages were calculated on a 2-day CEMS average for each test period. Due to the short run time period on the Petcoke blend, a 30-day rolling average comparison in lbs/hr was not possible.

The average opacity for the baseline test was 1.3% and the blend test was 2.7%. The FDEP allowable rate for opacity is 20%. There was no significant increase in opacity.

Section 2.0 presents a brief source description and diagram of the sample point locations.

Section 3.0 outlines the procedures and test methods used along with diagrams of sampling trains used.

Section 4.0 presents the test results and comparison tables.

All supporting documentation, field data sheets, laboratory data, sample calculations, calibration data, and quality assurance/quality control measures are included in the appendices to this report.

2.0 SOURCE DESCRIPTION

Polk Power Station is located at County Road 630 approximately 13 miles southwest of Bartow in Polk County, Florida. Unit No. 1 is an integrated coal gasification combined cycle (IGCC) generating unit. It's net capacity is 192 MW when fired with Syngas fuel. The source sampling location consists of a circular stack 19 ft. in diameter with four sample ports located 90° apart on the stack circumference. A diagram of the stack sampling location is included in Figure 1 along with other pertinent information on the test site.

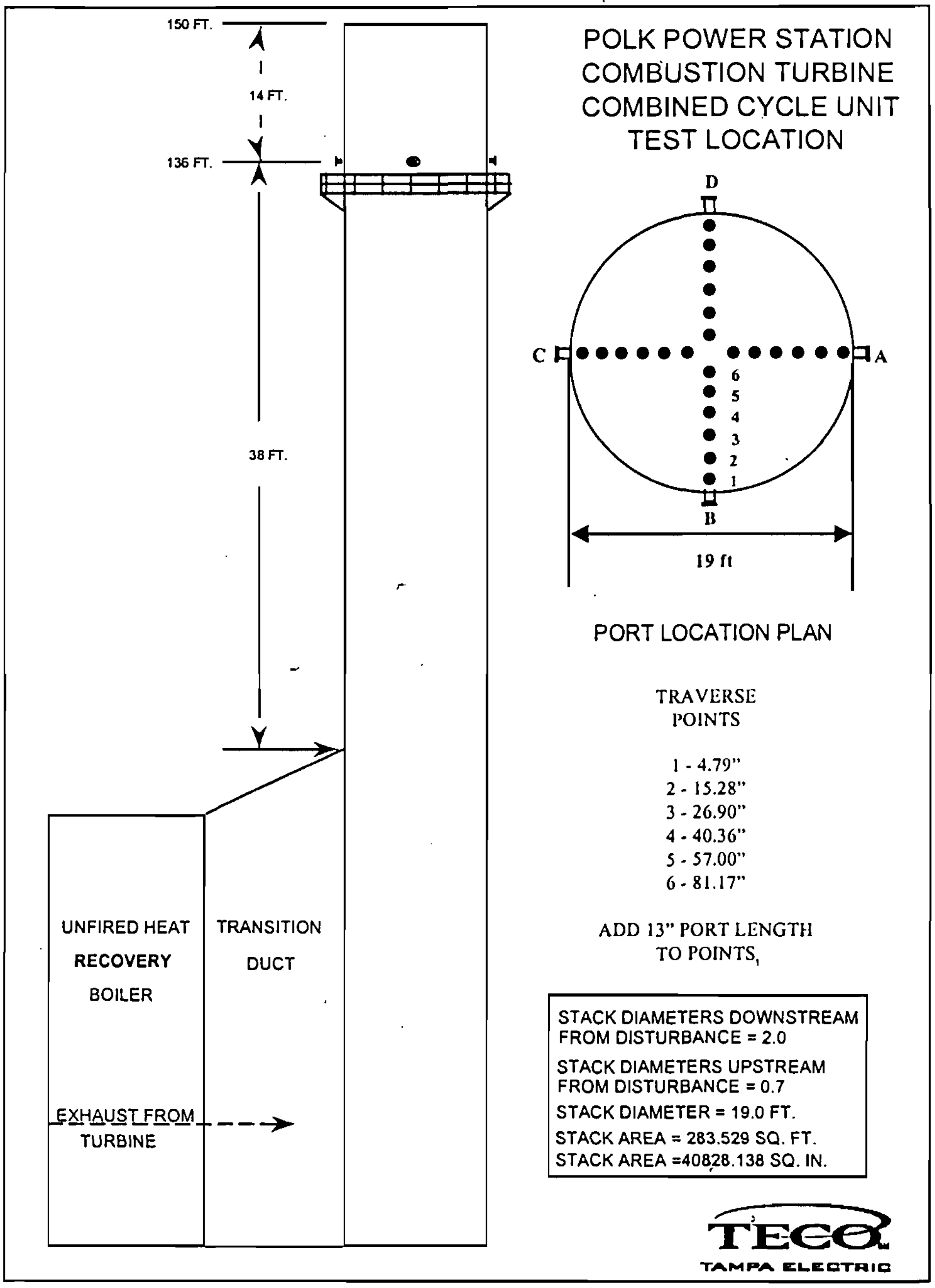
150 FT.
14 FT.
136 FT.
38 FT.
POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION
D
C
A
B
6
5
4
3
2
1
19 ft
PORT LOCATION PLAN
TRAVERSE
POINTS
1 - 4.79"
2 - 15.28"
3 - 26.90"
4 - 40.36"
5 - 57.00"
6 - 81.17"
ADD 13" PORT LENGTH
TO POINTS
STACK DIAMETERS DOWNSTREAM FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.
UNFIRED HEAT
RECOVERY
BOILER
TRANSITION
DUCT
EXHAUST FROM
TURBINE
TECO
TAMPA ELECTRIC

FIGURE 1

3.0 TEST PROCEDURES/SAMPLING TRAIN DIAGRAMS

Sulfuric Acid Mist sampling was performed according to U.S. EPA Method 8 "Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources". Sampling was performed using the equipment depicted on Figure 2.

Sulfur Dioxide (SO_2), Nitrogen Oxides (NO_x) and Opacity emissions were taken from the Continuous Emissions Monitoring System (CEMS) readings.

Gas sampling and analysis was performed according to U.S. EPA Method 3-B "Gas Analysis for Determination of Emission Rate Correction Factor, or Excess Air ". Sampling was performed using the equipment depicted in Figure 3 and 4.

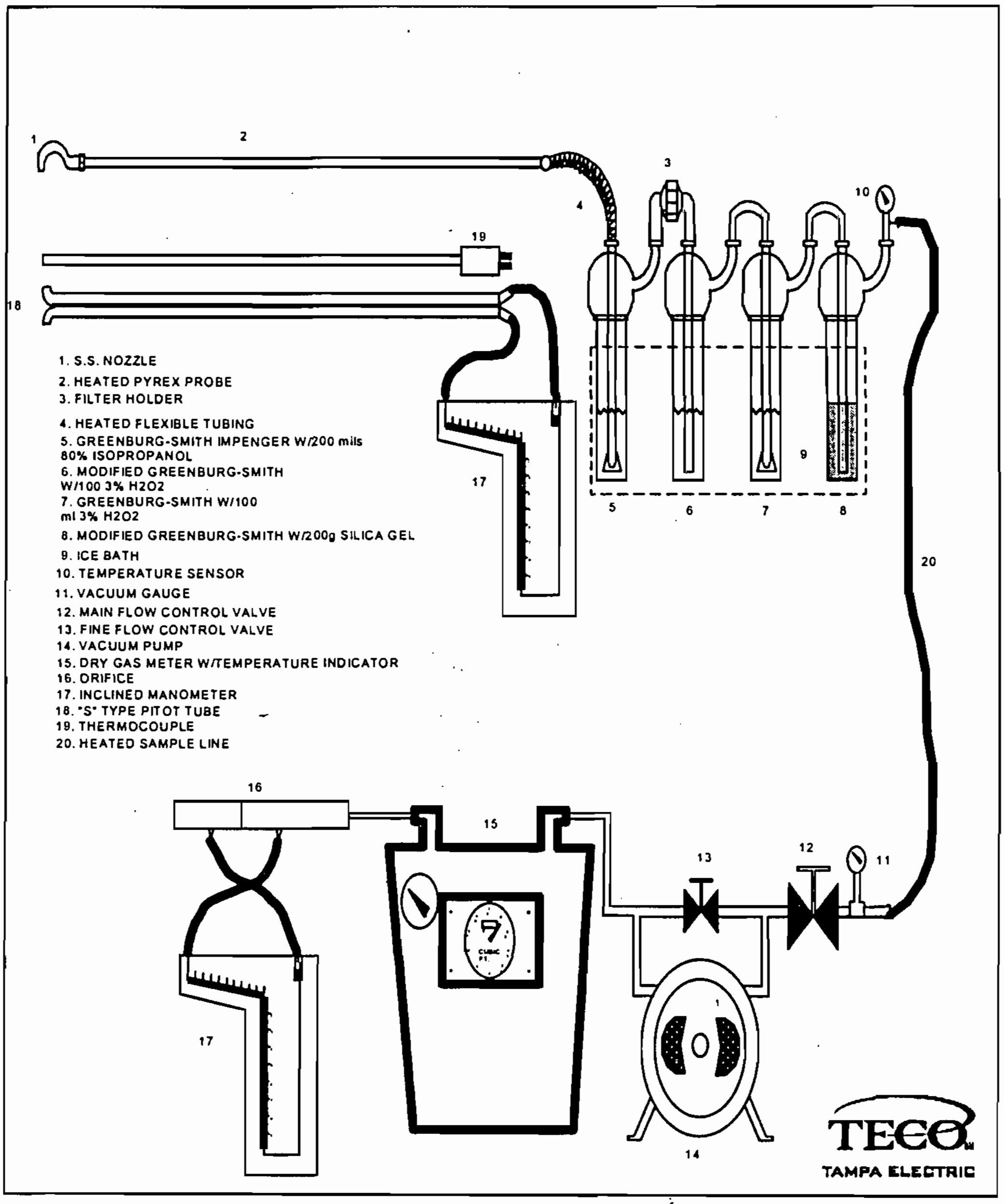

FIGURE 2
SULFURIC ACID MIST SAMPLING TRAIN
USEPA METHOD 8

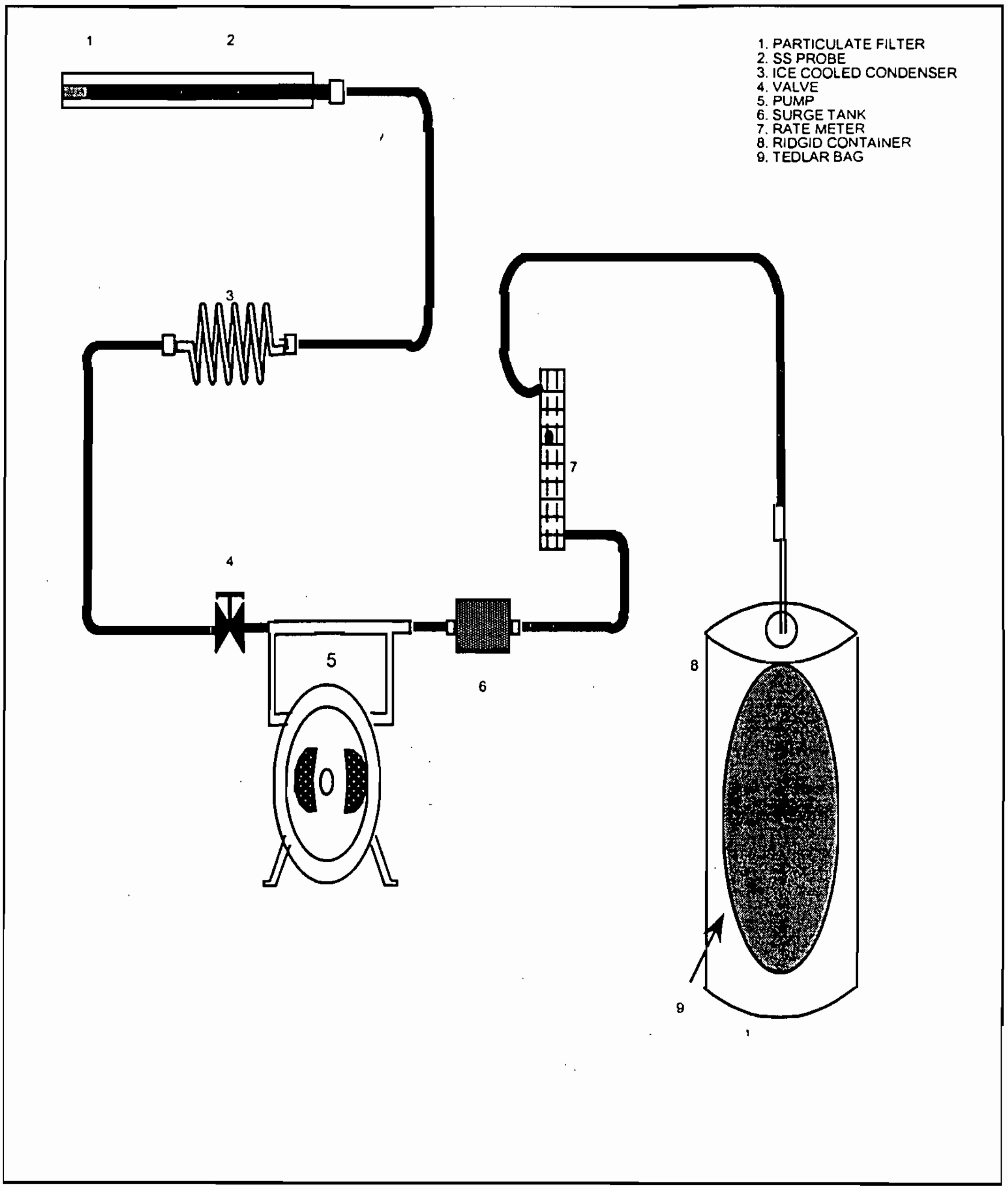

FIGURE 3

INTEGRATED GAS SAMPLING TRAIN

USEPA METHOD 3-B

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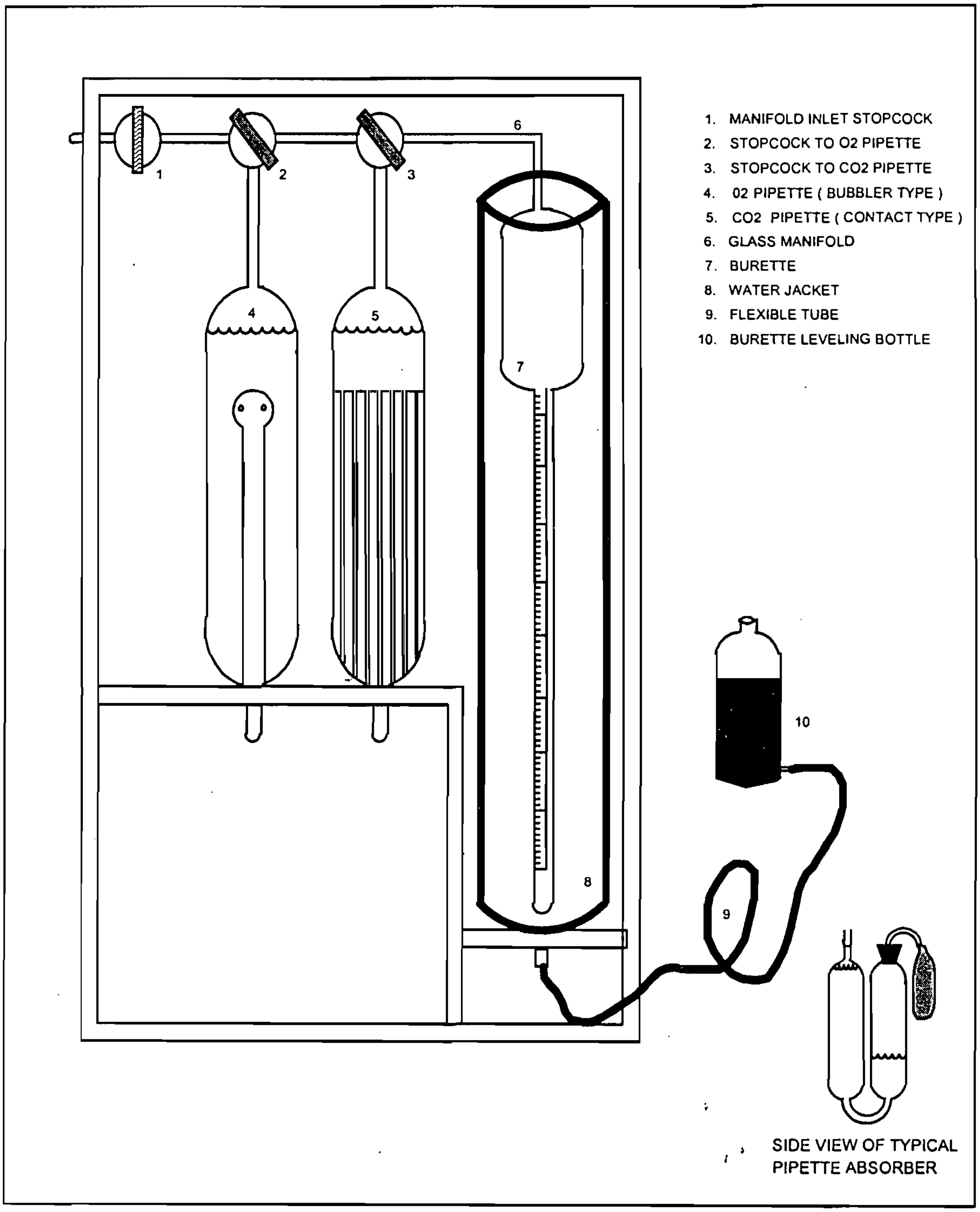

FIGURE 4

ORSAT ANALYZER

USEPA METHOD 3-B

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4.0 SUMMARY OF RESULTS

Table 1 presents the Continuous Emission Monitoring System (CEMS) data from the Baseline Test and the Fuel Blend Test. Data is presented comparing SO_2, NO_x and Opacity during Baseline and Fuel Blend Tests.

TABLE 1
POLK POWER STATION UNIT NO. 1
CONTINUOUS EMISSION MONITORING SYSTEM DATA

PARAMETER	BASELINE	FUEL BLEND	EMISSION RATE
SO_2	0.176	0.153	lbs/MMBtu
NO_x	0.093	0.085	lbs/MMBtu
Opacity	1.3	2.7	%

Table 2 presents stack test data from the Baseline Test and the Fuel Blend Test comparing sulfuric acid mist test levels.

TABLE 2
POLK POWER STATION UNIT NO. 1
STACK TEST DATA

PARAMETER	BASELINE	FUEL BLEND	EMISSION RATE
H_2SO_4	0.005	0.005	lbs/MMBtu

Table 3 presents Fuel Analysis from the Baseline vs. Blend tests.

TABLE 3 POLK POWER STATION UNIT NO. 1 FUEL ANALYSIS DATA			
PARAMETER	Coal Baseline	60% Coal 40% Petcoke Blend	Units
Total Moisture	12.9	6.82	%
Ash, as Received	8.97	4.58	%
BTU, as Received	11313	13443	Btu/Lbs
Sulfur, as Received	2.88	3.16	%
BTU, Moisture-Ash Free, Calc	14479	15172	Btu/Lb
Pounds SO2/Million BTU, Coal	4.84	4.46	Lb/MMBtu
Ash, Dry Basis	10.3	4.91	%
BTU, Dry Basis	12988	14427	Btu/Lb
Sulfur, Dry Basis	3.31	3.39	%
Carbon, as Received	63.16	76.33	%
Hydrogen, as Received	4.33	4.17	%
Nitrogen, as Received	1.39	1.49	%
Oxygen, as Received (Calculated)	6.27	3.38	%
Carbon, Dry Basis	72.51	81.92	%
Hydrogen, Dry Basis	4.97	4.48	%
Nitrogen, Dry Basis	1.60	1.60	%
Oxygen, Dry Basis (Calculated)	7.19	3.63	%
Chlorine by Bomb/IC, as Received	0.10	0.07	%
Chlorine by Bomb/IC, Dry Basis	0.12	0.07	%
Volatiles, Dry Basis	39.05	25.38	%
Volatiles, as Received	34.01	23.65	%

UNIT OPERATIONS SUMMARY

Fuel sample composites were taken for coal and Petcoke/coal blends during barge loading prior to leaving the port. A certified NELAP laboratory performed all analysis and details are included in Appendix E.

Operational data during the baseline and fuel blend testing can be found in Appendix C.

SOURCE SAMPLING NOMENCLATURE

A	=	Absorbance of sample.
A_n	=	Cross-sectional area of nozzle, m5 (ft5).
A_s	=	Cross-sectional area of stack, m5 (ft5).
B_{ws}	=	Water vapor in the gas steam, proportion by volume.
C	=	Concentration of particulate matter, (lbs/dscf), Method 5,17.
C	=	Concentration of NO_x, as NO_2, basis, corrected to standard conditions, mg/dscm (lbs/dscf), Method 7.
C_a	=	Concentration of acetone blank residue, mg/g.
$CH_2\,SO_4$	=	Sulfuric acid (including SO_3) concentration, g/dscm (lbs/dscf).
C_p	=	Pitot tube coefficient, dimensionless.
c_s	=	Concentration of stack gas particulates, dry basis corrected to standard conditions, g/dscm (lbs/dscf).
CSO_2	=	Sulfur dioxide concentration, mg/dscm (lbs/dscf).
E	=	Pollutant emissions, lbs/10^6 Btu.
EM	=	Particulate emission rate, lbs/hr.
F	=	Factor ratio of generated flue gases to calorific value of fuel, Method 5,17.
F	=	Dilution factor (i.e., 25/5, 25/10, etc.) required only if sample dilution was needed to reduce the absorbance to the range of calibration, Method 7.
FDA	=	Fraction of dry air.
I	=	Percent of isokinetic sampling, %.
K_c	=	Spectrophotometer calibration factor.
K_p	=	Pitot tube constant,

$$34.97 m/\sec \left[\frac{(g/g\text{-}mole)(mmHg)}{(^\circ K)(mmH20)} \right] 1/2$$

Metric

$$85.49 ft/\sec\left[\frac{(lb/lb\text{-}mole)(''\,Hg)}{(^{\circ}K)(mmH2O)}\right]1/2$$

English

L_a = Maximum acceptable leakage rate for either a pretest leak check or a leak check following a component change; equal to 0.00057 m^3/min (0.02 ft^3/min) or 4% of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak check conducted prior to the "ith" component change (i = 1, 2, 3,...n), m^3/min (ft/min).

L_p = Leakage rate observed during the post test leak check, m^3/min (ft^3/min).

m = Mass of NO_x as NO_2 in gas sample, :g.

m_a = Mass of acetone residue after evaporation, mg.

M_d = Molecular weight of stack gas, dry basis, g/g-mole (lb/lb-mole).

m_f = Filter weight gain, mg.

m_n = Total amount of particulate collected, mg.

M_s = Molecular weight of stack gas, wet basis, g/g-mole (lb/lb-mole), or $M_d(1 - B_{ws}) = 18.0\ B_{ws}$.

M_w = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

N = Normality of $Ba(ClO_4)_2 \cong 3H_2O$ titrant, g-eq/l.

N = Normality of barium perchlorate titrant, meq/ml.

P_a = Density of acetone, mg/ml (see bottle label).

P_{bar} = Barometric pressure at sampling site, mm Hg (in. Hg).

P_f = Final absolute pressure of flask, mm Hg (in. Hg).

P_g = Stack static pressure, mm Hg (in. Hg).

P_i = Initial absolute pressure of flask, mm Hg (in. Hg).

P_s = Absolute stack pressure, 760 mm Hg (29.92 in. Hg).

P_w = Density of water, 0.9982 g/ml (0.0022 lb/ml).

Q_s = Volumetric flow rate, actual cubic feet per min, acf/min.

Q_{std} = Dry volumetric stack gas flow rate corrected to standard conditions dsm^3/hr (dscf/hr).

R = Ideal gas constant, 0.06236 (mm Hg - m^3)/(EK - g - mole) for metric units and 21.85 (in. Hg - ft^3)(ER - 1b - mole) for English units.

S.V.P.	=	Saturated vapor pressure of water at average stack temperature mm Hg (in. Hg).
T_f	=	Final absolute temperature of flask, K (ER).
T_i	=	Initial absolute temperature of flask, K (ER).
T_m	=	Absolute average dry gas meter temperature, K (ER).
t_s	=	Stack temperature, EC (EF).
T_s	=	Absolute stack temperature, K (ER), or 273 + t_s for metric system or 460 + t_s for English system.
T_{std}	=	Standard absolute temperature, 293K (528ER).
V_a	=	Volume of acetone blank, ml, (Method 5,17).
V_a	=	Volume of sample aliquot titrated, ml, (Method 6).
V_a	=	Volume of absorbing solution, 25 ml, (Method 7).
V_a	=	Volume of sample aliquot titrated, 100 ml for H_2SO_4 and 10ml for SO_2 (Method 8).
V_{aw}	=	Volume of acetone used in wash, ml.
V_f	=	Final volume of condenser water, ml.
V_f	=	Volume of flask and valve, ml.
V_i	=	Initial volume of condenser water, ml.
V_{ic}	=	Total volumes of liquid and silica gel collected in impingers, ml.
V_m	=	Dry gas volume measured by dry gas meter, scm (dcf).
$V_{m(std)}$	=	Volume of gas sample measured by the dry gas meter and corrected to standard condition, dscm (dscf).
v_s	=	Average stack gas velocity calculated by Method 2, m/sec (ft/sec).
V_{sc}	=	Sample volume at standard conditions (dry basis), ml.
V_{soln}	=	Total volume of solution in which the sulfur dioxide sample is contained, 100 ml, (method 6).
V_{soln}	=	Total volume of solution in which the H_2SO_4 or SO_2 sample is contained, 250 ml or 1000 ml, respectively, (Method 8).
V_t	=	Volume of $Ba(ClO_4)_2 \cong 3H_2O$ titrant used for the sample, ml, (Method 8).
V_t	=	Volume of barium perchlorate titrant used for the sample (average of replicate titrations), ml, (Method 6).
V_{tb}	=	Volume of barium perchlorate titrant used for the blank, ml.
$V_{w(std)}$	=	Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).

$V_{wc(std)}$	=	Volume of condensed water vapor, corrected to standard conditions, sm^3(scf).
$V_{wsg(std)}$	=	Volume of water vapor collected in silica gel, corrected to standard conditions, sm^3 (scf).
W_a	=	Weight of acetone wash residue, mg.
W_f	=	Final weight of silica gel or silica gel plus impinger, g.
W_i	=	Initial weight of silica gel or silica gel plus impinger, g.
Y	=	Dry gas meter calibration factor.
)H	=	Average pressure differential across the orifice meter, mm (in) H_2O.
)H@	=	Measurement of pressure differential across the orifice meter, mm (in.) H_2O.
)p	=	Average velocity head of stack gas, mm (in.) H_2O.
$)V_m$	=	Incremental volume measured by dry gas meter at each traverse point, dm^3 (dcf).
%CO	=	Percent CO by volume (dry basis), average of three CO values.
$\%CO_2$	=	Percent CO_2 by volume (dry basis), average of three analyses.
%EA	=	Percent excess air, %.
$\%N_2$	=	Percent N_2 by volume (dry basis), average of three N_2 values.
$\%O_2$	=	Percent O_2 by volume (dry basis), average of three O_2 values.
0.262	=	Ratio of O_2 to N_2 in air, v/v.
2	=	50/25, the aliquot factor, (Method 7).
13.6	=	Specific gravity of mercury (Hg).
18.0	=	Molecular weight of water, g/g-mole (lb/lb-mole).
32.03	=	Equivalent weight of sulfur dioxide.
60	=	Seconds per minute (sec/min).
100	=	Conversion to percent, %.
3600	=	Conversion factor, (sec/hr).
2	=	Total sampling time, min.
2_1	=	Interval of sampling time from beginning of a run until first component change, min.
2_i	=	Interval of sampling time between two successive component changes, beginning with first and second changes, min.
2_p	=	Interval of sampling time from final (nth) component change until the end of the sampling run, min.

APPENDIX A

SOURCE TEST CALCULATIONS

A-1 BASELINE SULFURIC ACID MIST CALCULATIONS

A-2 FUEL BLEND SULFURIC ACID MIST CALCULATIONS

A-1 BASELINE SULFURIC ACID MIST CALCULATIONS

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Test Summary

Plant: Polk Power Station
Date: 02/07/00 -02/08/00
Sampling Location: Stack
Operating Conditions: Baseload

	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Average
Gas Flow Rate									
acfm	1366047.5	1374893.7	1370300.5	1370300.5	1355840.5	1360433.6	1351247.3	1364006.1	1364133.7
dscfm	866391.5	864442.5	865226.9	861984.7	850867.9	853857.7	850877.5	855426.6	858634.4
Average Stack Temperature, °F	335.8	334.7	333.0	331.3	335.7	335.6	336.0	336.0	334.8
% Isokinetic	98.1	100.1	99.9	101.5	103.5	102.2	101.4	100.2	100.9
Moisture, %H2O	4.6	5.4	5.2	5.6	5.3	5.3	5.1	5.2	5.2
Sampled Volume, dscf	39.622	40.351	40.317	40.788	41.038	40.720	40.251	39.976	40.383
Condensate Volume, ml	40.6	49.1	46.8	51.4	49.2	48.3	46.0	46.4	47.2
Meter Temperature, °F	83.6	83.5	82.9	73.5	61.4	66.6	75.0	81.0	75.9
C_{H2SO4}, lb/dscf	5.172E-07	6.034E-07	5.707E-07	7.124E-07	4.759E-07	5.913E-07	6.315E-07	7.295E-07	6.0399E-07
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$, lbs/hour	26.886	31.296	29.627	36.845	24.296	30.293	32.24	37.442	31.116
$E_{H2SO4} = C_{H2SO4} \times$ F-factor, lbs/MMBtu	0.004	0.005	0.005	0.006	0.004	0.005	0.005	0.006	0.005

F-factor is assumed as 8089 dscf/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 1

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.05 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.98 " Hg	Average Orifice Meter, ΔH:	1.436 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.924 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	83.6 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	335.8 °F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.173 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	40.6 ml
	80.2 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	1.914 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.622 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.046 %
$FDA = 1.0 - B_{ws}$	0.954 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.75 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.21 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.3 ft/second
$Q_s = v_s \times A_s \times 60$	1366047.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	866391.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	98.1 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	3.88 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.172E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	26.886 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.004 lb/MMBtu

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 2

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.00 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.93 " Hg	Average Orifice Meter, ΔH:	1.468 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.736 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	83.5 $^{\circ}F$
Gas Analysis:	8.2 % CO_2	Average Stack Temp., T_s:	334.7 $^{\circ}F$
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.179 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	49.1 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.315 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.351 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.054 %
$FDA = 1.0 - B_{ws}$	0.946 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.78 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.82 ft/second
$Q_s = v_s \times A_s \times 60$	1374893.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	864442.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	100.1 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.6 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	6.034E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	31.296 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.005 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 3

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.00 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.93 " Hg	Average Orifice Meter, ΔH:	1.46 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.655 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	82.9 °F
Gas Analysis:	8.2 % CO_2	Average Stack Temp., T_s:	333 °F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.177 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	46.8 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.206 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.317 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.78 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.17 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.55 ft/second
$Q_s = v_s \times A_s \times 60$	1370300.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	865226.9 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	99.9 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.35 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.707E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	29.627 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.005 lb/MMBtu

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 4

Plant: Polk Power Station
Date: 02/07/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.88 " Hg	Average Orifice Meter, ΔH:	1.445 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.483 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	73.5 °F
Gas Analysis:	8.4 % CO_2	Average Stack Temp., T_s:	331.3 °F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.177 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	51.4 ml
	79.8 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E-02 \times V_{lc}$	2.423 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.788 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.056 %
$FDA = 1.0 - B_{ws}$	0.944 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.82 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.16 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.55 ft/second
$Q_s = v_s \times A_s \times 60$	1370300.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	861984.7 dscf/minute
$I = (T_s + 460) \times ((2.67E-03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.5 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	5.48 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E-04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	7.124E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	36.845 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.006 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 5

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.88 " Hg	Average Orifice Meter, ΔH:	1.38 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.797 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	61.4 ^oF
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	335.7 ^oF
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.161 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	49.2 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.319 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	41.038 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.053 %
$FDA = 1.0 - B_{ws}$	0.947 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.7 ft/second
$Q_s = v_s \times A_s \times 60$	1355840.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	850867.9 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	103.5 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	3.7 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.759E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	24.296 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.004 lb/MMBtu

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 6

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.88 " Hg	Average Orifice Meter, ΔH:	1.388 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.883 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	66.6 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	335.6 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.165 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	48.3 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.277 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.72 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.053 %
$FDA = 1.0 - B_{ws}$	0.947 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.97 ft/second
$Q_s = v_s \times A_s \times 60$	1360433.6 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	853857.7 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.2 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.55 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	5.913E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	30.293 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.005 lb/MMBtu

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40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 7

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.00 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.93 " Hg	Average Orifice Meter, ΔH:	1.393 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.988 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	75.0 ^oF
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	336.0 ^oF
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.158 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	46.0 ml
	80.2 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.168 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.251 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.051 %
$FDA = 1.0 - B_{ws}$	0.949 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.75 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.15 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.43 ft/second
$Q_s = v_s \times A_s \times 60$	1351247.3 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	850877.5 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.4 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	4.8 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	6.315E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	32.24 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.005 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations

Run Number 8

Plant: Polk Power Station
Date: 02/08/2000
Sampling Location: Stack
Operating Conditions: Baseload

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.91 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.84 " Hg	Average Orifice Meter, ΔH:	1.418 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.286 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	81.0 ^{o}F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	336.0 ^{o}F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.167 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	46.4 ml
	80.2 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.187 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.976 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.052 %
$FDA = 1.0 - B_{ws}$	0.948 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.75 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.14 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	80.18 ft/second
$Q_s = v_s \times A_s \times 60$	1364006.1 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	855426.6 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	100.2 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.0099 meq/ml
Volume Titrant Blank, V_{tb}	0.05 ml
Volume Titrant Sample, V_t	5.5 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	7.295E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	37.442 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.006 lb/MMBtu

A-2 FUEL BLEND SULFURIC ACID MIST CALCULATIONS

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Test Summary

Plant: Polk Power Station
Date: 02/14/2000 - 02/15/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

	Run #1	Run #2	Run #3	Run #4	Run #5	Run #6	Run #7	Run #8	Average
Gas Flow Rate									
acfm	1338318.3	1356691.1	1339509.1	1338998.8	1315522.5	1321306.5	1318754.7	1325559.5	1331832.6
dscfm	843539.1	854282.4	848842.8	845048.1	835419.0	831832.4	839273.4	828288.0	840815.7
Average Stack Temperature, °F	322.7	321.8	320.5	319.9	317.8	319.2	319.2	318.3	319.9
% Isokinetic	102.0	102.3	101.1	102.0	101.5	102.1	101.1	103.4	101.9
Moisture, %H2O	6.0	6.2	5.6	5.9	6.2	7.0	6.3	7.8	6.4
Sampled Volume, dscf	40.136	40.755	40.017	40.220	39.544	39.638	39.585	39.915	39.97625
Condensate Volume, ml	54.4	57.4	50.2	53.4	55.2	63.0	56.6	72.0	57.775
Meter Temperature, °F	76.0	79.6	79.8	77.0	76.4	83.9	95.5	89.6	82.2
C_{H2SO4}, lb/dscf	7.117E-07	4.809E-07	3.913E-07	4.403E-07	6.609E-07	6.552E-07	9.889E-07	9.713E-07	6.62563E-07
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$, lbs/hour	36.021	24.649	19.929	22.324	33.128	32.701	49.797	48.271	33.353
$E_{H2SO4} = C_{H2SO4} \times$ F-factor, lbs/MMBtu	0.006	0.004	0.003	0.004	0.005	0.005	0.008	0.008	0.005

F-factor is assumed as 8089 dscf/MMBtu

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Method 8 Test Calculations

Run Number 1

Plant: Polk Power Station
Date: 02/14/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.80 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.74 " Hg	Average Orifice Meter, ΔH:	1.421 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.219 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	76.0 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	322.7 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.151 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	54.4 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.564 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.136 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.06 %
$FDA = 1.0 - B_{ws}$	0.94 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.05 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	78.67 ft/second
$Q_s = v_s \times A_s \times 60$	1338318.3 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	843539.1 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.0 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	5.33 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	7.117E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	36.021 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.006 lb/MMBtu

40 CFR 60, Appendix A - Test Methods
Method 8 Test Calculations
Run Number 2

Plant: Polk Power Station
Date: 02/14/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.80 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.74 " Hg	Average Orifice Meter, ΔH:	1.462 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	42.131 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	79.6 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	321.8 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.167 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	57.4 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.706 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.755 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.062 %
$FDA = 1.0 - B_{ws}$	0.938 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.03 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	79.75 ft/second
$Q_s = v_s \times A_s \times 60$	1356691.1 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	854282.4 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.3 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	3.67 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.809E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	24.649 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.004 lb/MMBtu

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Run Number 3

Plant: Polk Power Station
Date: 02/14/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.75 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.69 " Hg	Average Orifice Meter, ΔH:	1.429 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.456 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	79.8 °F
Gas Analysis:	8.2 % CO_2	Average Stack Temp., T_s:	320.5 °F
	11.8 % O_2	Average $\sqrt{\Delta p}$:	1.154 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	50.2 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.366 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.017 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.056 %
$FDA = 1.0 - B_{ws}$	0.944 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.78 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.12 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	78.74 ft/second
$Q_s = v_s \times A_s \times 60$	1339509.1 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	848842.8 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.1 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	2.94 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	3.913E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	19.929 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.003 lb/MMBtu

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Run Number 4

Plant: Polk Power Station
Date: 02/14/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.70 " Hg	Nozzle Area, A_n:	0.0002204 ft.^{2}
Stack Pressure, P_s:	29.64 " Hg	Average Orifice Meter, ΔH:	1.424 " H_2O
Effective Stack Area, A_s:	283.53 ft.^{2}	Sample Volume, V_m:	41.521 ft.^{3}
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	77 ^oF
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	319.9 ^oF
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.152 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	53.4 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.517 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	40.220 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.059 %
$FDA = 1.0 - B_{ws}$	0.941 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \%CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.07 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	78.71 ft/second
$Q_s = v_s \times A_s \times 60$	1338998.8 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	845048.1 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.0 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	3.32 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	4.403E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	22.324 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.004 lb/MMBtu

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Run Number 5

Plant: Polk Power Station
Date: 02/15/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.90 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.84 " Hg	Average Orifice Meter, ΔH:	1.408 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	40.507 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	76.4 °F
Gas Analysis:	8.5 % CO_2	Average Stack Temp., T_s:	317.8 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.138 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	55.2 ml
	79.5 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.602 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.544 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.062 %
$FDA = 1.0 - B_{ws}$	0.938 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.84 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.11 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	77.33 ft/second
$Q_s = v_s \times A_s \times 60$	1315522.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	835419 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.5 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	4.88 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	6.609E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	33.128 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.005 lb/MMBtu

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Run Number 6

Plant: Polk Power Station
Date: 02/15/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.89 " Hg	Average Orifice Meter, ΔH:	1.415 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.102 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	83.9 ^oF
Gas Analysis:	8.5 % CO_2	Average Stack Temp., T_s:	319.2 ^oF
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.141 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	63.0 ml
	79.5 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.97 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.638 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.07 %
$FDA = 1.0 - B_{ws}$	0.93 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.84 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.01 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	77.67 ft/second
$Q_s = v_s \times A_s \times 60$	1321306.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	831832.4 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	102.1 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	4.85 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	6.552E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	32.701 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.005 lb/MMBtu

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Run Number 7

Plant: Polk Power Station
Date: 02/15/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	30.05 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.99 " Hg	Average Orifice Meter, ΔH:	1.439 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.781 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	95.5 ^oF
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	319.2 ^oF
	12.2 % O_2	Average $\sqrt{\Delta p}$:	1.141 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	56.6 ml
	79.8 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.668 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.585 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.063 %
$FDA = 1.0 - B_{ws}$	0.937 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.77 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.03 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	77.52 ft/second
$Q_s = v_s \times A_s \times 60$	1318754.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	839273.4 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.1 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	7.29 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	9.889E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	49.797 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.008 lb/MMBtu

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Run Number 8

Plant: Polk Power Station
Date: 02/15/2000
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.89 " Hg	Average Orifice Meter, ΔH:	1.441 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	41.820 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	89.6 °F
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	318.3 °F
	12.0 % O_2	Average $\sqrt{\Delta p}$:	1.142 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	72.0 ml
	80.0 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	3.394 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.915 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.078 %
$FDA = 1.0 - B_{ws}$	0.922 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.76 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	28.84 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)}$	77.92 ft/second
$Q_s = v_s \times A_s \times 60$	1325559.5 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	828288 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	103.4 %

Data from Laboratory Analysis:

Normality of Barium Perchiorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	7.22 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	9.713E-07 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	48.271 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.008 lb/MMBtu

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Run Number 9

Plant: Polk Power Station
Date: 2/15/00
Sampling Location: Stack
Operating Conditions: Baseload, Blend 1

Sample Time, θ:	60 minutes	Nozzle Diameter, D_n:	0.201 inches
Barometric Pressure, P_b:	29.95 " Hg	Nozzle Area, A_n:	0.0002204 $ft.^2$
Stack Pressure, P_s:	29.89 " Hg	Average Orifice Meter, ΔH:	1.429 " H_2O
Effective Stack Area, A_s:	283.53 $ft.^2$	Sample Volume, V_m:	42.173 $ft.^3$
Pitot Coefficient, C_p:	0.84 dimensionless	Average Meter Temp., T_m:	98.3 ^oF
Gas Analysis:	8.0 % CO_2	Average Stack Temp., T_s:	318.2 ^oF
	12.2 % O_2	Average $\sqrt{\Delta p}$:	1.136 " H_2O
	0.0 % CO	Condensate Volume, V_{lc}:	56.2 ml
	79.8 % N_2	Meter Box Y:	0.989 dimensionless

Data Calculated from Source Measurements:

$V_{w(std)} = 4.714E\text{-}02 \times V_{lc}$	2.649 scf
$V_{m(std)} = 17.647 \times V_m \times Y \times (P_b + (\Delta H / 13.6)) / (T_m + 460)$	39.623 dscf
$B_{ws} = V_{w(std)} / (V_{m(std)} + V_{w(std)})$	0.063 %
$FDA = 1.0 - B_{ws}$	0.937 %
$M_d = (0.44 \times \%CO_2) + (0.32 \times \%O_2) + (0.28 \times (\%N_2 + \% CO))$	29.77 lb/lb mole
$M_s = (M_d \times FDA) + (18.0 \times B_{ws})$	29.03 lb/lb mole
$v_s = 85.49 \times C_p \times (\sqrt{\Delta p}) \times (\sqrt{(T_s + 460) / (M_s \times P_s)})$	77.26 ft/second
$Q_s = v_s \times A_s \times 60$	1314331.7 acf/minute
$Q_{s(std)} = Q_s \times FDA \times (528 / (T_s + 460)) \times (P_s / 29.92))$	834740.7 dscf/minute
$I = (T_s + 460) \times ((2.67E\text{-}03 \times V_{lc}) + (V_{m(std)} / 17.647)) \times 100 / (\theta \times P_s \times A_n \times v_s \times 60)$	101.7 %

Data from Laboratory Analysis:

Normality of Barium Perchlorate titrant, N	0.00999 meq/ml
Volume Titrant Blank, V_{tb}	0.04 ml
Volume Titrant Sample, V_t	58.3 ml
Volume of Sample Aliquot, V_a	100 ml
Total Volume of Solution, V_{soln}	500 ml

Calculated Data from Laboratory Analysis:

$C_{H2SO4} = 1.081E\text{-}04 \times (N \times (V_t - V_{tb}) \times (V_{soln} / V_a)) / V_{m(std)}$	7.939E-06 lb/dscf
$E_{H2SO4} = C_{H2SO4} \times Q_{s(std)} \times 60$	397.635 lb/hour
$E_{H2SO4} = C_{H2SO4} \times$ F-factor (assumed as 8089 dscf/MMBtu heat input)	0.064 lb/MMBtu

APPENDIX B

LABORATORY ANALYTICAL DATA

B-1 BASELINE SULFURIC ACID MIST LABORATORY DATA

B-2 FUEL BLEND SULFURIC ACID MIST LABORATORY DATA

B-1 BASELINE SULFURIC ACID MIST LABORATORY DATA

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5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

Report For: David Smith, Air Programs

Report Date: 02/08/00

Laboratory ID: AA53532

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant

Sampled By: R. BARTHELETTE
Date Sampled: 02/07/00
Time Sampled: 11:56:00 AM

POLK STACK TEST
BASELINE FOR PETCOKE TEST BURN

Laboratory Results

Parameter	Result	Units	MDL	Method
Normality of BaCl2 * 2H2O	0.0099		0.0001	
SO3, Avg. of Blank Titrations	0.05	milliliters	0.01	EPA - Meth.8
SO3, Run #1, Avg. of Titrations	3.88	milliliters	0.01	EPA - Meth.8
SO3, Run #2, Avg. of Titrations	4.60	milliliters	0.01	EPA - Meth.8
SO3, Run #3, Avg. of Titrations	4.35	milliliters	0.01	EPA - Meth.8
SO3, Run #4, Avg. of Titrations	5.48	milliliters	0.01	EPA - Meth.8
SO3, Volume of Contained Sample	500	milliliters	1	EPA - Meth.8
SO3, Volume of Sample Aliquot	100	milliliters	0.1	EPA - Meth.8

Comments:

Samples received at the lab were isopropanol solutions recovered from stack test for SO3 analysis.

RL Dorey

Robert Dorey,
Supervisor of Laboratory Services

TECO TAMPA ELECTRIC

Corporate Environmental Laboratory Services

5012 Causeway Blvd • Tampa Fl. 33619 • Ph (813)630-7378 • Fax (813)630-7360 • CompQAP #910140G • DOH #E54272

Report For: David Smith, Air Programs

Report Date: 03/15/00

Laboratory ID: AA53545

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Plant
Project Account Code: L3
SAMPLE DESCRIPTION: ISOPROPANOL SOLUTION
RECOVERD FROM STACKTEST FOR SO3 ANALYSIS

Sampled By: R. BARTHELETTE
Date Sampled: 02/08/00
Time Sampled: 10:01:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of $BaCl_2 \cdot 2H_2O$	0.0099		0.0001			
SO_3, Avg. of Blank Titrations	0.05	milliliters	0.01			
SO_3, Run #5, Avg. of Titrations	3.70	milliliters	0.01			
SO_3, Run #6, Avg. of Titrations	4.55	milliliters	0.01			
SO_3, Run #7, Avg. of Titrations	4.80	milliliters	0.01			
SO_3, Run #8, Avg. of Titrations	5.50	milliliters	0.01			
SO_3, Volume of Contained Sample	500	milliliters	1			
SO_3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Robert Dorey,
Supervisor of Laboratory Services

B-2 FUEL BLEND SULFURIC ACID MIST LABORATORY DATA

TECO TAMPA ELECTRIC

Corporate Environmental
Laboratory Services

5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

Report For: David Smith, Air Programs

Report Date: 02/16/00

Laboratory ID: AA53638

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Unit #1 Stack Test
Project Account Code:
SAMPLE DESCRIPTION: UNIT #1 STACK TEST

Sampled By: R. BARTHELETTE
Date Sampled: 02/14/00
Time Sampled: 11:33:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of BaCl2 * 2H2O	0.00999		0.0001			
SO3, Avg. of Blank Titrations	0.04	milliliters	0.01			
SO3, Run #1, Avg. of Titrations	5.33	milliliters	0.01			
SO3, Run #2, Avg. of Titrations	3.67	milliliters	0.01			
SO3, Run #3, Avg. of Titrations	2.94	milliliters	0.01			
SO3, Run #4, Avg. of Titrations	3.32	milliliters	0.01			
SO3, Volume of Contained Sample	500	milliliters	1			
SO3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Robert Dorey,
Supervisor of Laboratory Services

TECO
TAMPA ELECTRIC

Corporate Environmental Laboratory Services

5012 Causeway Blvd * Tampa Fl. 33619 * Ph (813)630-7378 * Fax (813)630-7360 * CompQAP #910140G * DOH #E54272

Report For: David Smith, Air Programs

Report Date: 03/23/00

Laboratory ID: AA53659

Sample Information

Location Code: SPECL-PK
Location Description: Polk Power Unit #1 Stack Test
Project Account Code:
SAMPLE DESCRIPTION: UNIT #1 STACK TEST

Sampled By: R. BARTHELETTE
Date Sampled: 02/15/00
Time Sampled: 10:20:00 AM

Laboratory Results

Parameter	Result	Units	MDL	Lower Limit	Upper Limit	Violation Check
Normality of BaCl2 * 2H2O	0.00999		0.0001			
SO3, Avg. of Blank Titrations	0.04	milliliters	0.01			
SO3, Run #5, Avg. of Titrations	4.88	milliliters	0.01			
SO3, Run #6, Avg. of Titrations	4.85	milliliters	0.01			
SO3, Run #7, Avg. of Titrations	7.29	milliliters	0.01			
SO3, Run #8, Avg. of Titrations	7.22	milliliters	0.01			
SO3, Run #9, Avg. of Titrations	58.3	milliliters	0.01			
SO3, Volume of Contained Sample	500	milliliters	1			
SO3, Volume of Sample Aliquot	100	milliliters	0.1			

Comments:

Due to the high titration value for Run #9 an analysis was run on the bottle labeled H2O2 for run #9 and treated like an SO3 sample. The H2O2 labeled sample was brought to a volume of 500 ml with 80% isopropanol. A 100ml aliquot was titrated, an average titration volume of 21.79mls was obtained.

Robert Dorey,
Supervisor of Laboratory Services

APPENDIX C

COMBUSTION TURBINE OPERATION DATA

C-1 BASELINE OPERATIONAL DATA

C-2 FUEL BLEND OPERATIONAL DATA

C-1 BASELINE OPERATIONAL DATA

Baseline

POLK POWER STATION DCS DATA

Date	Time	Fuel To Slurry Preparation	Combustion Turbine Output (MW)	Diluent N2 To Turbine (KSCFH)	Fuel Flow To Turbine (KSCFH)	Fuel LHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (MMBTU/Hr)	NOx Emissions (Lb/Hr)	NOx Emissions (lb/MMBTU)	SO2 Emissions (Lb/Hr)	SO2 Emissions (lb/MMBTU)	Opacity %
02/07/00	10:00	Kentucky 9	191.8	5793	6607	247.2	267.7	1768	173.264	0.098	247.52	0.140	0.6
02/07/00	11:00	Kentucky 9	191.8	5816.0	6622	247.5	268	1774	175.626	0.099	266.1	0.150	1.3
02/07/00	12:00	Kentucky 9	191.8	5838.0	6623	247.4	267.8	1774	177.4	0.100	301.58	0.170	1.9
02/07/00	13:00	Kentucky 9	191.8	5852.0	6626	246.8	267.1	1770	178.77	0.101	300.9	0.170	1.6
02/07/00	14:00	Kentucky 9	191.8	5865.0	6642	245.7	265.8	1765	180.03	0.102	335.35	0.190	2.1
02/07/00	15:00	Kentucky 9	191.8	5859.0	6655	245.2	265.1	1764	179.928	0.102	335.16	0.190	2.3
02/07/00	16:00	Kentucky 9	191.8	5852.0	6662	244.8	264.6	1762	181.486	0.103	334.78	0.190	2.9
02/07/00	17:00	Kentucky 9	191.8	5843.0	6650	245	264.8	1761	177.861	0.101	352.2	0.200	1.5
02/07/00	18:00	Kentucky 9	191.8	5836.0	6642	245.5	265.3	1762	174.438	0.099	352.4	0.200	1.6
02/07/00	19:00	Kentucky 9	191.8	5832.0	6633	245.4	265.1	1759	172.382	0.098	316.62	0.180	1.1
02/08/00	8:00	Kentucky 9	191.3	5816.0	6718	243.5	263.4	1770	141.6	0.080	460.2	0.260	0.9
02/08/00	9:00	Kentucky 9	190.0	5832.0	6682	243.8	263.8	1763	142.803	0.081	282.08	0.160	0.8
02/08/00	10:00	Kentucky 9	190.0	5872.0	6677	244.1	264.2	1764	142.884	0.081	299.88	0.170	1.2
02/08/00	11:00	Kentucky 9	190.0	5896.0	6679	244.2	264.4	1766	144.812	0.082	282.56	0.160	1
02/08/00	12:00	Kentucky 9	190.0	5917.0	6681	244	264.3	1766	150.11	0.085	264.9	0.150	0.8
02/08/00	13:00	Kentucky 9	190.1	5937.0	6685	243.3	263.5	1761	149.685	0.085	281.76	0.160	0.5
02/08/00	14:00	Kentucky 9	190.0	5938.0	6672	243.4	263.6	1759	151.274	0.086	281.44	0.160	0.9
02/08/00	15:00	Kentucky 9	189.9	5927.0	6658	241.7	264.1	1758	154.704	0.088	298.86	0.170	0.9
		Average	191.1	5862.3	6656	244.9	265.1	1765	164	0.093	311	0.176	1.3

C-2 FUEL BLEND OPERATIONAL DATA

Blend

POLK POWER STATION DCS DATA

Date	Time	Fuel To Slurry Preparation	Combustion Turbine Output (MW)	Diluent N2 To Turbine (KSCFH)	Fuel Flow To Turbine (KSCFH)	Fuel LHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (BTU/SCF)	Fuel HHV To Turbine (MMBTU/Hr)	NOx Emissions (Lb/Hr)	NOx Emissions (lb/MMBTU)	SO2 Emissions (Lb/Hr)	SO2 Emissions (lb/MMBTU)	Opacity %
02/14/00	9:00	40% Pet Coke	185.1	5980.0	6465	245.7	264.5	1710	140.22	0.082	222.3	0.130	1.3
02/14/00	10:00	40% Pet Coke	185.1	5966.0	6457	246.4	265.2	1712	143.808	0.084	256.8	0.150	1.3
02/14/00	11:00	40% Pet Coke	185.0	5979.0	6453	247.3	266.2	1718	146.03	0.085	223.34	0.130	1.3
02/14/00	12:00	40% Pet Coke	185.0	5994.0	6450	247.0	265.9	1715	150.92	0.088	240.1	0.140	2.9
02/14/00	13:00	40% Pet Coke	185.1	5996.0	6441	247.5	266.4	1716	154.44	0.090	240.24	0.140	2.9
02/14/00	14:00	40% Pet Coke	184.8	6017.0	6436	247.6	266.4	1714	157.688	0.092	239.96	0.140	2.6
02/14/00	15:00	40% Pet Coke	185.0	6022.0	6436	247.7	266.6	1716	159.588	0.093	223.08	0.130	2.6
02/14/00	16:00	40% Pet Coke	184.9	5983.0	6421	248.2	267.0	1714	161.116	0.094	205.68	0.120	2.9
02/14/00	17:00	40% Pet Coke	185.0	5970.0	6412	248.5	267.3	1714	159.402	0.093	205.68	0.120	2.8
02/15/00	8:00	40% Pet Coke	183.3	5756.0	6545	242.8	261.1	1709	146.974	0.086	239.26	0.140	2.1
02/15/00	9:00	40% Pet Coke	182.1	5668.0	6515	242.5	260.9	1700	142.8	0.084	306	0.180	2.7
02/15/00	10:00	40% Pet Coke	182.0	5610.0	6516	242.4	260.9	1700	136	0.080	357	0.210	2.6
02/15/00	11:00	40% Pet Coke	181.9	5649.0	6526	242.5	261.1	1704	136.32	0.080	306.72	0.180	2.4
02/15/00	12:00	40% Pet Coke	180.3	5663.0	6476	242.8	261.5	1693	133.747	0.079	270.88	0.160	3.3
02/15/00	13:00	40% Pet Coke	180.1	5695.0	6459	243.0	261.7	1690	135.2	0.080	304.2	0.180	3.9
02/15/00	14:00	40% Pet Coke	179.9	5714.0	6448	243.2	261.9	1689	136.809	0.081	304.02	0.180	4.2
02/15/00	15:00	40% Pet Coke	180.0	5750.0	6443	243.0	261.8	1686	136.566	0.081	286.62	0.170	4.5
		Average		5847.8	6465	245.2	263.9	1706	146	0.085	261	0.153	2.7

APPENDIX D

CONTINUOUS EMISSION MONITORING SYSTEM DATA

D-1 BASELINE CEMS STACK TEST LOGS

D-2 FUEL BLEND CEMS STACK TEST LOGS

D-3 CONTINUOUS EMISSIONS RELATIVE ACCURACY TEST AUDIT RESULTS 1999

D-4 CONTINUOUS EMISSIONS QUALITY ASSURANCE LINEARITY CHECKS - QUARTER 4, 1999

D-1 BASELINE CEMS STACK TESTS LOGS

Polk Station
HRSG
Tampa

Today's Date: 02/17/2000
Time: 07:02:06

Reporting Period
Day: 02/07/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
0100	8.0	30.1	0.140	265.7	28.2	0.097	53172	1841
0200	8.0	28.2	0.140	245.4	28.3	0.098M	52416M	1815
0300	8.0	27.1	0.130	239.1	28.1	0.097	53160	1841
0400	8.0	27.6	0.130	239.3	28.2	0.097	52230	1808
0500	8.0	26.9	0.130	235.3	29.0	0.100	52692	1824
0600	8.0	27.2	0.130	231.4	28.8	0.099	51252	1774
0700	8.0	27.4	0.130	238.0	28.8	0.099	52326	1812
0800	8.1	28.2	0.130	243.9	28.7	0.098	52104	1827
0900	8.1	28.7	0.140	245.0	28.8	0.098	51432	1803
1000	8.1	30.9	0.150	272.8	29.2	0.099	53184	1864
1100	8.1	35.0	0.170	315.6	29.3	0.100	54312	1904
1200	8.1	36.0	0.170	342.3	29.6	0.101	57282	2008
1300	8.0	38.8	0.190	356.2	29.6	0.102	55296	1915
1400	8.1	40.0	0.190	363.9	30.1	0.102	54804	1921
1500	8.1	39.9	0.190	358.3	30.3	0.103	54090	1896
1600	8.1	41.8	0.200	377.9	29.7	0.101	54468	1909
1700	8.1	42.8	0.200	386.6	29.0	0.099M	54408M	1907
1800	8.2	38.9	0.180	339.0	29.1	0.098	52494	1863
1900	8.1	34.8	0.160	307.5	28.6	0.097	53238	1866
2000	8.2	35.8	0.170	315.5	28.4	0.096	53094	1884
2100	8.2	32.8	0.150	288.4	27.8	0.094	52962	1880
2200	8.2	30.9	0.140	272.7	27.2	0.091	53166	1887
2300	8.2	29.3	0.140	227.5	27.1	0.091M	46770M	1660
2400	8.1	31.6	0.150	257.2	27.0	0.092	49026	1719
AVRGE	8.1	32.9	0.156	290.2	28.7	0.098	52891	1852

Daily SO2 3.5 Tons
Daily CO2 5851.6 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error
X - Calibration Expired

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Polk Station
HRSG
Tampa

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Today's Date: 02/17/2000
Time: 07:02:52

Reporting Period
Day: 02/08/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
0100	8.1	32.2	0.150	283.4	26.5	0.090M	53028M	1859
0200	8.1	31.6	0.150	266.0	26.6	0.091	50712	1778
0300	8.2	31.7	0.150	277.3	26.4	0.089M	52698M	1870
0400	8.2	37.9	0.180	345.1	25.8	0.087	54858	1947
0500	8.2	48.8	0.230	475.4	24.8	0.083	58686	2083
0600	8.2	64.1	0.300	617.5	24.2	0.081	58032	2060
0700	8.2	55.5	0.260	443.2	23.9	0.080M	48108M	1707
0800	8.2	34.6	0.160	303.2	24.2	0.081	52794	1874
0900	8.2	36.1	0.170	327.3	24.2	0.081	54624	1939
1000	8.2	33.7	0.160	304.9	24.4	0.082	54498	1934
1100	8.2	32.5	0.150	292.3	25.2	0.085	54174	1923
1200	8.2	33.6	0.160	301.7	25.4	0.085	54096	1920
1300	8.1	33.8	0.160	357.4	25.3	0.086M	63690M	2233
1400	8.2	36.2	0.170	323.5	26.3	0.088	53826	1910
1500	8.2	36.4	0.170	324.3	27.0	0.091	53670	1905
1600	8.2	32.7	0.150	292.5	27.6	0.093M	53892M	1913
1700	7.6	31.6	0.160	256.7	25.6	0.093M	48936M	1610
1800	0.0	0.0	0.000	0.0	0.0	0.000M	0M	0
1900	0.0	0.0	0.000	0.0	0.0	0.000	0	0
2000	0.0	0.0	0.000	0.0	0.0	0.000	0	0
2100	0.0	0.0	0.000	0.0	0.0	0.000	0	0
2200	0.0	0.0	0.000	0.0	0.0	0.000	0	0
2300	0.0	0.0	0.000	0.0	0.0	0.000	0	0
2400	0.0	0.0	0.000	0.0	0.0	0.000	0	0
AVRGE	5.8	26.8	0.126	241.3	18.1	0.061	38347	1353

Daily SO2 2.9 Tons
Daily CO2 4275.3 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error
X - Calibration Expired

D-2 FUEL BLEND CEMS STACK TEST LOGS

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Polk Station
HRSG
Tampa

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Today's Date: 02/17/2000
Time: 07:01:16

Reporting Period
Day: 02/14/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
0100	6.7	10.4	0.060	63.8	28.1	0.116M	36960M	1072
0200	8.0	16.2	0.080	120.1	20.2	0.070	44670	1547
0300	8.1	15.8	0.070	117.9	21.6	0.074	44952	1576
0400	8.2	23.0	0.110	184.5	22.3	0.075	48330	1715
0500	8.3	25.3	0.120	207.5	22.5	0.075	49398	1774
0600	8.2	25.7	0.120	208.3	23.5	0.079	48828	1733
0700	8.1	26.4	0.120	213.2	24.0	0.082	48648	1705
0800	8.2	27.1	0.130	224.8	24.3	0.082	49974	1773
0900	8.2	31.7	0.150	247.6	24.9	0.084M	47046M	1670
1000	8.2	28.6	0.130	240.0	25.2	0.085	50556	1794
1100	8.1	29.0	0.140	250.1	25.7	0.088	51948	1821
1200	8.1	29.6	0.140	260.9	26.4	0.090	53088	1861
1300	8.0	28.3	0.140	252.1	26.7	0.092	53658	1858
1400	8.1	27.3	0.130	241.0	27.2	0.093	53190	1865
1500	8.1	25.6	0.120	228.3	27.5	0.094	53724	1883
1600	8.1	24.6	0.120	216.1	27.4	0.093	52920	1855
1700	8.1	26.6	0.130	235.3	27.7	0.094	53298	1868
1800	8.1	27.7	0.130	238.7	28.2	0.096	51918	1820
1900	8.1	28.1	0.130	244.4	27.5	0.094M	52404M	1837
2000	8.1	28.2	0.130	243.8	27.8	0.095	52080	1826
2100	8.1	27.3	0.130	259.8	28.2	0.096	57318	2009
2200	8.1	27.0	0.130	233.2	28.1	0.096	52038	1824
2300	8.1	27.1	0.130	241.7	28.3	0.096M	53730M	1884
2400	8.1	24.7	0.120	212.2	28.5	0.097	51762	1815
AVRGE	8.1	25.5	0.121	216.1	25.9	0.089	50518	1767

Daily SO2 2.6 Tons
Daily CO2 5582.3 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error
X - Calibration Expired

Polk Station
HRSG
Tampa

Today's Date: 02/17/2000
Time: 06:59:55

Reporting Period
Day: 02/15/2000

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 ppm	SO2 lb/mmBtu	SO2 lb/hr	NOX ppm	NOX lb/mmBtu	FLOW kscfh	Ht Inp mmBtu
0100	8.1	24.5	0.120	228.4	27.6	0.094	56154	1969
0200	8.2	28.2	0.130	235.7	27.0	0.091	50340	1786
0300	8.2	33.2	0.160	280.7	28.3	0.095	50928	1807
0400	8.3	33.0	0.150	275.6	27.6	0.092	50310	1807
0500	8.3	33.8	0.160	284.7	27.4	0.091	50736	1822
0600	8.3	26.8	0.120	227.6	26.5	0.088	51162	1838
0700	8.3	30.0	0.140	250.5	25.9	0.086	50310	1807
0800	8.4	39.5	0.180	335.9	25.5	0.084	51222	1862
0900	8.4	45.8	0.210	390.8	24.4	0.080	51396	1868
1000	8.4	39.2	0.180	334.5	24.3	0.080	51408	1869
1100	8.4	35.9	0.160	303.6	24.2	0.079	50940	1852
1200	8.4	38.9	0.180	328.8	24.3	0.080	50922	1851
1300	8.2	37.8	0.180	322.8	24.0	0.081	51444	1826
1400	8.3	37.4	0.170	314.1	24.5	0.081	50598	1818
1500	8.3	38.0	0.180	319.2	24.9	0.083	50598	1818
1600	8.3	41.7	0.190	356.9	25.2	0.084	51558	1852
1700	8.3	37.4	0.170	317.1	25.6	0.085	51078	1835
1800	8.3	35.0	0.160	300.4	26.4	0.088	51708	1857
1900	8.2	30.3	0.140	256.5	27.1	0.091	51006	1810
2000	8.2	26.0	0.120	218.4	27.8	0.094	50592	1795
2100	8.3	22.8	0.110	193.2	28.3	0.094	51036	1833
2200	8.3	20.8	0.100	172.1	28.4	0.094	49836	1790
2300	8.3	21.0	0.100	176.0	28.6	0.095	50478	1813
2400	8.3	14.9	0.070	122.8	28.4	0.094	49632	1783
AVRGE	8.3	32.2	0.149	272.8	26.3	0.088	51058	1833

Daily SO2 3.3 Tons
Daily CO2 5791.0 Tons

Legend
C - Out of Control
F - Fans Off
D - Out of Service
I - Insufficient Data
M - Maintenance Fault
A - Calibration Error
X - Calibration Expired

POLK COUNTY QUARTERLY EMISSION REPORT
HRSG

DATE	30-DAY Nox Oil (lbs)	30-DAY Gas (lbs)	Daily Oil (lbs)	Daily Gas (lbs)	Hours Boiler
02/01/2000	199.4	69.2	125.1	42.9	5
02/02/2000	195.2	69.2	124.7	0.0	24
02/03/2000	192.5	73.6	146.8	138.3	24
02/04/2000	188.5	79.1	120.8	168.3	24
02/05/2000	187.9	83.0	139.6	127.8	24
02/06/2000	187.9	88.9	0.0	176.7	24
02/07/2000	187.9	94.7	0.0	182.7	24
02/08/2000	187.9	99.6	0.0	164.5	17
02/10/2000	181.4	99.6	87.8	0.0	4
02/11/2000	171.7	102.6	141.5	110.7	24
02/12/2000	171.7	106.8	0.0	138.7	24
02/13/2000	170.3	110.8	134.7	132.5	24
02/14/2000	170.3	115.4	0.0	157.3	24
02/15/2000	170.3	120.4	0.0	160.5	24
02/16/2000	170.3	126.5	0.0	196.0	24
02/17/2000	171.6	132.6	134.7	191.2	24
02/18/2000	171.6	138.3	0.0	189.9	24
02/19/2000	171.6	143.9	0.0	187.6	24
02/20/2000	171.6	149.4	0.0	185.4	24
02/21/2000	171.6	152.8	0.0	176.2	24
02/22/2000	171.6	154.2	0.0	184.9	24
02/23/2000	171.6	155.1	0.0	157.2	24
02/24/2000	171.6	156.7	0.0	165.3	24
02/25/2000	171.6	157.0	0.0	165.2	24
02/26/2000	165.4	157.0	109.7	0.0	1
03/02/2000	165.4	157.0	0.0	0.0	1

POLK COUNTY QUARTERLY EMISSION REPORT
HRSG

DATE	30-DAY So2 Oil (lbs)	30-DAY Gas (lbs)	Daily Oil (lbs)	Daily Gas (lbs)	Hours Boiler
02/01/2000	21.7	281.3	19.0	2.8	5
02/02/2000	22.0	281.3	21.4	0.0	24
02/03/2000	22.0	278.4	25.6	249.9	24
02/04/2000	21.8	275.2	20.0	296.4	24
02/05/2000	22.1	275.2	22.9	380.9	24
02/06/2000	22.1	272.5	0.0	317.7	24
02/07/2000	22.1	270.2	0.0	290.7	24
02/08/2000	22.1	270.3	0.0	352.8	17
02/10/2000	21.4	270.3	13.3	0.0	4
02/11/2000	21.1	272.2	30.0	315.6	24
02/12/2000	21.1	268.5	0.0	310.2	24
02/13/2000	21.4	261.6	26.6	158.1	24
02/14/2000	21.4	259.0	0.0	219.3	24
02/15/2000	21.4	256.5	0.0	272.7	24
02/16/2000	21.4	254.9	0.0	151.5	24
02/17/2000	21.9	251.4	25.0	110.7	24
02/18/2000	21.9	245.0	0.0	175.3	24
02/19/2000	21.9	238.3	0.0	138.3	24
02/20/2000	21.9	231.6	0.0	105.4	24
02/21/2000	21.9	233.2	0.0	105.9	24
02/22/2000	21.9	225.3	0.0	92.9	24
02/23/2000	21.9	216.3	0.0	184.9	24
02/24/2000	21.9	207.4	0.0	149.6	24
02/25/2000	21.9	206.5	0.0	181.1	24
02/26/2000	20.6	206.5	13.2	0.0	1
03/02/2000	20.6	206.5	0.0	0.0	1

D-3 CONTINUOUS EMISSIONS RELATIVE ACCURACY TEST AUDIT RESULTS - 1999

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

SUBJECT: Continuous Emissions Monitoring (CEM) Systems
Relative Accuracy Test Audit Results

TO: David Knapp

FROM: Robert Barthelette Jr.

DATE: 16, December 1999

Corporate Environmental Services, Air Services Group, performed a Relative Accuracy Test Audit (RATA) on combustion turbine HRSG CEMS (001) on November 8 through November 16, 1999. These audits were conducted in accordance with the system supplier's directions, and meet the requirements of 40 CFR 75, Appendix B.

All results were deemed acceptable, meeting the performance specifications of 40 CFR 75, Appendix A, Performance Specification 3.34.

Attached to this memorandum, you will find data summary sheets for each system tested. All testing was performed under my direction, and the results are certified as true and accurate.

These records should be maintained at your facility for a period of three (3) years to comply with 40 CFR 75, Appendix F, Record Keeping Requirements. Corporate Environmental Services will maintain all supporting information for this test for the same time period.

Should you have any questions regarding this information, feel free to contact me at extension 38227.

Robert A. Barthelette Jr.
Technician
Corporate Environmental Services
Air Services

cc: J. Nail
J. Woodlee
D. Coleman
D. Smith

SHAREDATA/AIR&WASTE/CEMS/RATA/RATA99/MEMOS

TECO
TAMPA ELECTRIC

RELATIVE ACCURACY TEST AUDIT
DATA SUMMARY

Plant: POLK POWER STATION

Unit: HRSG PRIMARY

Plant ORIS Code: 7242

Boiler or Stack ID: #1

Test Date: 09/7&9/99

Run Number	Start Time	End Time	RM - 6C SO2 ppm	CEM SO2 ppm	Difference ppm	RM - 7E/3A NOx lbs/Mmbtu	CEM NOx lbs/Mmbtu	Difference lbs/MMBtu	RM- 3A CO2 %	CEM CO2 %	Difference %	Run Flag
1	1847	1908	12.600	12.481	0.119	0.078	0.074	0.004	7.640	8.262	-0.622	1
2	1937	1958	13.200	13.096	0.104	0.075	0.073	0.002	7.740	8.354	-0.614	1
3	2014	2035	13.700	12.838	0.862	0.077	0.073	0.004	7.900	8.366	-0.466	0
4	2104	2125	13.800	12.714	1.086	0.076	0.073	0.003	7.890	8.399	-0.509	0
5	0719	0740	9.300	8.877	0.423	0.08	0.078	0.002	7.890	8.201	-0.311	1
6	0819	0840	9.600	8.654	0.946	0.08	0.079	0.001	7.900	8.207	-0.307	0
7	0915	0936	9.500	8.698	0.802	0.083	0.082	0.001	7.860	8.135	-0.275	1
8	1001	1022	8.700	9.117	-0.417	0.081	0.083	-0.002	7.770	8.136	-0.366	1
9	1048	1109	8.500	8.935	-0.435	0.083	0.086	-0.003	7.790	8.064	-0.274	1
10	1130	1151	8.700	9.008	-0.308	0.085	0.086	-0.001	7.630	8.072	-0.442	1
11	1209	1230	8.2	8.724	-0.524	0.084	0.087	-0.003	7.760	8.074	-0.314	1
12	1255	1316	8.1	8.492	-0.392	0.083	0.087	-0.004	7.810	8.021	-0.211	1
Means of Accepted:			9.644	9.714	-0.070	0.081	0.082	0.000	7.766	8.147	-0.381	
Standard Deviations (n-1) of Differences:					0.460			0.003			0.149	

SO2 Confidence Coefficient:		0.353
SO2 Relative Accuracy:	4.35	
SO2 Bias Test:	Passed	
SO2 Bias Adjustment Factor:		1.000
NOx Confidence Coefficient:		0.002
NOx Relative Accuracy:	3.16	
NOx Bias Test:	Passed	
NOx Bias Adjustment Factor:		1.000
CO2 Confidence Coefficient:		0.114
CO2 Relative Accuracy:		6.08

Number of Valid Runs:	9
T-value:	2.306

CEM RACK

SO2 Analyzer S/N:	43B-48910-282
NOx Analyzer S/N:	42D-53124-294
CO2 Analyzer S/N:	EN-029

TECO
TAMPA ELECTRIC

RELATIVE ACCURACY TEST AUDIT
DATA SUMMARY

Plant: POLK POWER STATION
Unit: HRSG BACKUP
Plant ORIS Code: 7242
Boiler or Stack ID: #1
Test Date: 09/09/1999

Run Number	Start Time	End Time	RM - 6C SO2 ppm	CEM SO2 ppm	Difference ppm	RM - 7E/3A NOx lbs/Mmbtu	CEM NOx lbs/Mmbtu	Difference lbs/MMBtu	RM- 3A CO2 %	CEM CO2 %	Difference %	Run Flag
1	0719	0740	9.300	8.929	0.371	0.08	0.079	0.001	7.890	8.119	-0.229	1
2	0819	0840	9.600	8.772	0.828	0.08	0.081	-0.001	7.900	8.126	-0.226	1
3	0915	0936	9.500	8.742	0.758	0.083	0.084	-0.001	7.860	8.053	-0.193	1
4	1001	1022	8.700	9.201	-0.501	0.081	0.085	-0.004	7.770	8.057	-0.287	1
5	1048	1109	8.500	9.003	-0.503	0.083	0.087	-0.004	7.790	7.990	-0.200	1
6	1130	1151	8.700	9.143	-0.443	0.085	0.088	-0.003	7.630	7.998	-0.368	1
7	1209	1230	8.200	8.792	-0.592	0.084	0.088	-0.004	7.760	7.996	-0.236	1
8	1255	1316	8.100	8.525	-0.425	0.083	0.088	-0.005	7.810	7.943	-0.133	1
9	1341	1402	7.900	8.350	-0.450	0.083	0.089	-0.006	7.850	7.996	-0.146	1
10					0.000			0.000			0.000	0
11					0.000			0.000			0.000	
12					0.000			0.000			0.000	
Means of Accepted:			8.722	8.829	-0.106	0.082	0.085	-0.003	7.807	8.031	-0.224	
Standard Deviations (n-1) of Differences:					0.584			0.002			0.071	

SO2 Confidence Coefficient:		0.449
SO2 Relative Accuracy:	6.29	
SO2 Bias Test:	Passed	
SO2 Bias Adjustment Factor:		1.000
NOx Confidence Coefficient:		0.002
NOx Relative Accuracy:	5.52	
NOx Bias Test:	Passed	
NOx Bias Adjustment Factor:		1.000
CO2 Confidence Coefficient:		0.055
CO2 Relative Accuracy:		3.48

Number of Valid Runs:	9
T-value:	2.306

CEM RACK

SO2 Analyzer S/N:	43B-49417-282
NOx Analyzer S/N:	42D-53126-294
CO2 Analyzer S/N:	EN-031

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: 1
Date: 11/16/99
Load: HIGH,192MW

Run #	Start Time	End Time	Reference Method Data Flow Rate (scfh)	Source Data Unit Load	Source Data CEMS Flow Rate (scfh)	Difference CEMS Flow Rate (scfh)
1	12:07	12:21	49548678.000	191.104	53104560.000	-3555882.000
2	12:22	12:33	49451007.000	191.306	49797120.000	-346113.000
3	12:34	12:44	49640552.000	191.084	51307380.000	-1666828.000
4	12:45	12:56	50082886.000	191.173	52852980.000	-2770094.000
5	12:57	13:10	49720685.000	191.222	51809940.000	-2089255.000
6	13:12	13:24	49747758.000	191.189	51581820.000	-1834062.000
7	13:24	13:34	49679427.000	191.218	51745140.000	-2065713.000
8	13:36	13:47	49949132.000	191.314	52079700.000	-2130568.000
9	13:48	13:58	49822211.000	191.176	53990940.000	-4168729.000
* 10	0:00	0:00				
* 11	0:00	0:00				
* 12	0:00	0:00				
Arithmetic Mean:			49738037.333	191.198	52029953.333	-2291916.000
			R_{ref}=	2.601	Standard Deviation:	1109812.954
					Confidence Coefficient:	853076.224
					Relative Accuracy (%):	6.32
					Bias Adjustment Factor:	1.000
					T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: 1
Date: 11/11/99
Load: MID,180

Run #	Start Time	End Time	Reference Method Data: Flow Rate (scfh)	Source Data: CEMS Flow Rate (scfh)	Difference: CEMS Flow Rate (scfh)
1	14:55	15:12	47000135.000	49091460.000	-2091325.000
2	15:17	15:29	46830213.000	49268160.000	-2437947.000
3	15:30	15:42	47483042.000	48638220.000	-1155178.000
4	15:44	15:56	47688787.000	49946340.000	-2257553.000
5	15:58	16:10	47403358.000	49539660.000	-2136302.000
6	16:14	16:24	47520527.000	49007520.000	-1486993.000
7	16:26	16:35	47786355.000	50421060.000	-2634705.000
8	16:36	16:45	48080908.000	50286960.000	-2206052.000
9	16:47	16:56	47565053.000	48331080.000	-766027.000
* 10	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 11	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 12	0:00	0:00	#DIV/0!	0.000	#DIV/0!
Arithmetic Mean:			47484264.222	49392273.333	-1908009.111
				Standard Deviation:	627872.033
				Confidence Coefficient:	482624.303
				Relative Accuracy (%):	**5.03**
				Bias Adjustment Factor:	**1.000**
				T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: 1
Date: 11/16/99
Load: LOW,165 MW

			Reference Method Data	Source Data	Difference
Run #	Start Time	End Time	Flow Rate (scfh)	CEMS Flow Rate (scfh)	CEMS Flow Rate (scfh)
1	8:27	8:39	46397799.000	48139560.000	-1741761.000
2	8:40	8:50	46610216.000	47565840.000	-955624.000
3	8:52	9:03	46598399.000	45584400.000	1013999.000
4	9:17	9:29	46147705.000	47698500.000	-1550795.000
5	9:30	9:41	46117811.000	47575020.000	-1457209.000
6	9:42	9:52	46076884.000	47006340.000	-929456.000
7	10:00	10:10	46027076.000	46789980.000	-762904.000
8	10:11	10:23	46604078.000	46296480.000	307598.000
9	10:24	10:35	46240982.000	48306300.000	-2065318.000
* 10	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 11	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 12	0:00	0:00	#DIV/0!	0.000	#DIV/0!
Arithmetic Mean:			46313438.889	47218046.667	-904607.778
				Standard Deviation:	996543.692
				Confidence Coefficient:	766009.918
				Relative Accuracy (%):	**3.61**
				Bias Adjustment Factor:	**1.000**
				T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: Unit 1 Backup
Date: 11/16/99
Load: HIGH,192MW

Run #	Start Time	End Time	Reference Method Data: Flow Rate (scfh)	Source Data: Unit Load	Source Data: CEMS Flow Rate (scfh)	Difference: CEMS Flow Rate (scfh)
1	12:07	12:21	49548678.000	191.104	52918500.000	-3369822.000
2	12:22	12:33	49451007.000	191.306	49606080.000	-155073.000
3	12:34	12:44	49640552.000	191.084	51118380.000	-1477828.000
4	12:45	12:56	50082886.000	191.173	52668540.000	-2585654.000
5	12:57	13:10	49720685.000	191.222	51622920.000	-1902235.000
6	13:12	13:24	49747758.000	191.189	51391920.000	-1644162.000
7	13:24	13:34	49679427.000	191.218	51559980.000	-1880553.000
8	13:36	13:47	49949132.000	191.314	51892980.000	-1943848.000
9	13:48	13:58	49822211.000	191.176	53805840.000	-3983629.000
* 10	0:00	0:00				
* 11	0:00	0:00				
* 12	0:00	0:00				
Arithmetic Mean:			49738037.333	191.198	51842793.333	-2104756.000

R_{ref}= 2.601

Standard Deviation:	1111611.505
Confidence Coefficient:	854458.710
Relative Accuracy (%):	**5.95**
Bias Adjustment Factor:	**1.000**
T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: Unit 1 Backup
Date: 11/11/99
Load: MID,180

Run #	Start Time	End Time	Reference Method Data Flow Rate (scfh)	Source Data CEMS Flow Rate (scfh)	Difference CEMS Flow Rate (scfh)
1	14:55	15:12	47000135.000	48881640.000	-1881505.000
2	15:17	15:29	46830213.000	49063980.000	-2233767.000
3	15:30	15:42	47483042.000	48428460.000	-945418.000
4	15:44	15:56	47688787.000	49744440.000	-2055653.000
5	15:58	16:10	47403358.000	49335840.000	-1932482.000
6	16:14	16:24	47520527.000	48799440.000	-1278913.000
7	16:26	16:35	47786355.000	50218980.000	-2432625.000
8	16:36	16:45	48080908.000	50084580.000	-2003672.000
9	16:47	16:56	47565053.000	48126540.000	-561487.000
* 10	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 11	0:00	0:00	#DIV/0!	0.000	#DIV/0!
* 12	0:00	0:00	#DIV/0!	0.000	#DIV/0!
Arithmetic Mean:			47484264.222	49187100.000	-1702835.778
				Standard Deviation:	629502.980
				Confidence Coefficient:	483877.958
				Relative Accuracy (%):	4.61
				Bias Adjustment Factor:	1.000
				T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

CEMS Flow Rate Relative Accuracy

Plant Name: POLK POWER STATION
Unit #: Unit 1 Backup
Date: 11/16/99
Load: LOW,165 MW

Run #	Start Time	End Time	Reference Method Data Flow Rate (scfh)	Source Data CEMS Flow Rate (scfh)	Difference CEMS Flow Rate (scfh)
1	8:27	8:39	46397799.000	47944440.000	-1546641.000
2	8:40	8:50	46610216.000	47372580.000	-762364.000
3	8:52	9:03	46598399.000	45385800.000	1212599.000
4	9:17	9:29	46147705.000	47504160.000	-1356455.000
5	9:30	9:41	46117811.000	47382660.000	-1264849.000
6	9:42	9:52	46076884.000	46808580.000	-731696.000
7	10:00	10:10	46027076.000	46592400.000	-565324.000
8	10:11	10:23	46604078.000	46096920.000	507158.000
9	10:24	10:35	46240982.000	48110220.000	-1869238.000
* 10	0:00	0:00	#DIV/0!	0.0000E+00	#DIV/0!
* 11	0:00	0:00	#DIV/0!	0.0000E+00	#DIV/0!
* 12	0:00	0:00	#DIV/0!	0.0000E+00	#DIV/0!
Arithmetic Mean:			46313438.889	47021973.333	-708534.444
				Standard Deviation:	998220.129
				Confidence Coefficient:	767298.539
				Relative Accuracy (%):	3.19
				Bias Adjustment Factor:	1.000
				T-Value:	2.306

* Runs not included in Relative Accuracy Calculaton

D-4 CONTINUOUS EMISSIONS QUALITY ASSURANCE LINEARITY CHECKS - QUARTER 4 1999

Polk Station

HRSG Start Time: 1320 Date: 11-30-99 End Time: 1505 Date: 11-30-99

.yzer SO2	LOW	MID	HIGH
REF GAS VALUE	64.11	132.90	227.00
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	13:30	13:40	13:50
RUN 1	63.22	130.14	225.12
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	14:00	14:10	14:20
RUN 2	64.54	132.41	224.84
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	14:45	14:55	15:05
RUN 3	62.98	131.56	223.93
AVERAGE=SUM/3	63.58	131.37	224.63
% ACCURACY	0.53	1.15	1.04
OUT OF CONTROL	NO	NO	NO
SERIAL NUMBER	ALM043962	AAL16115	SG9151300BAL
EXPIRATION DATE	07/15/2000	07/23/2000	06/04/2000

Analyzer NOX	LOW	MID	HIGH
REF GAS VALUE	64.59	140.70	229.00
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	13:30	13:40	13:50
RUN 1	65.90	138.13	224.04
E	11/30/1999	11/30/1999	11/30/1999
E	14:00	14:10	14:20
RUN 2	65.30	137.63	222.77
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	14:45	14:55	15:05
RUN 3	65.50	137.43	223.02
AVERAGE=SUM/3	65.57	137.73	223.28
% ACCURACY	0.98	2.11	2.50
OUT OF CONTROL	NO	NO	NO
SERIAL NUMBER	ALM043962	AAL16115	SG9151300BAL
EXPIRATION DATE	07/15/2000	07/23/2000	06/04/2000

Analyzer CO2	LOW	MID	HIGH
REF GAS VALUE	4.97	11.13	17.80
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	13:30	13:40	13:50
RUN 1	5.09	11.09	17.60
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	14:00	14:10	14:20
RUN 2	5.08	11.11	17.55
DATE	11/30/1999	11/30/1999	11/30/1999
TIME	14:45	14:55	15:05
RUN 3	5.10	11.08	17.53
ERAGE=SUM/3	5.09	11.09	17.56
.CCURACY	0.12	0.36	1.35
OUT OF CONTROL	NO	NO	NO
SERIAL NUMBER	ALM043962	AAL16115	SG9151300BAL
EXPIRATION DATE	07/15/2000	07/23/2000	06/04/2000

APPENDIX E

FUEL ANALYSIS

E-1 BASELINE COMPOSITE

E-2 FUEL BLEND COMPOSITES

E-1 BASELINE COMPOSITE

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Wednesday, March 22, 2000

Report For: John McDaniel
Martin Duff, Fuels

Sample Information

Sample ID: **AA53522**
Location Code: SPECL-PK
Location Description: Polk Power Plant Test Burn
Composite for: Baseline Test
Lab Supplying Sample: CTE St. Rose

Lab Submittal Date: 02/08/00
Sample Collection Date: 01/27/00
Sample Collector: CTE, ST. ROSE
Shipment No.: 8694
Supplier lab ID. Number: 1414-49

Laboratory Results

Ash Mineral Analysis	Result	Units	Lower Limit	Upper Limit	Violation
Aluminum Oxide, Al203	18.07	%			
Base/Acid Ratio	0.415				
Calcium Oxide, CaO	5.49	%			
Fouling Index for Bituminous Ash	0.336				
Fouling Tendency for Bituminous Ash	Medium				
Iron Oxide, Fe2O3	19.28	%			
Magnesium Oxide, MgO	1.00	%			
Phosphorus, P2O5	0.09	%			
Potassium Oxide, K2O	2.40	%			
Silica Value	66.3	%			
Silicon Dioxide, SiO2	50.79	%			
Slagging Index for Bituminous Ash	1.374				
Slagging Tendency for Bituminous Ash	Medium				
Sodium Oxide, Na2O	0.81	%			
Sulfur Trioxide, SO3	3.90	%			
T250	2393	Degrees F			
Titanium Dioxide, TiO2	1.00	%			
Undetermined, Ash Minerals	-2.80	%			

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Coal Analysis - As Received	Result	Units	Lower Limit	Upper Limit	Violation
Ash, as Received	8.97	%			
BTU, as Received	11313	BTU/Lb			
Carbon, as Received	63.16	%			
Fixed Carbon, as Received	44.12	%			
Hydrogen, as Received	4.33	%			
Nitrogen, as Received	1.39	%			
Oxygen, as Received	6.27	%			
Sulfur, as Received	2.88	%			
Volatiles, as Received	34.01	%			

Coal Analysis - Dry Basis	Result	Units	Lower Limit	Upper Limit	Violation
Ash, Dry Basis	10.3	%			
BTU, Dry Basis	12988	BTU/Lb.			
Carbon, Dry Basis	72.51	%			
Fixed Carbon, Dry Basis	50.65	%			
Hydrogen, Dry Basis	4.97	%			
Nitrogen, Dry Basis	1.60	%			
Oxygen, Dry Basis	7.19	%			
Sulfur, Dry Basis	3.31	%			
Volatiles, Dry Basis	39.05	%			

Coal Analysis - Miscellaneous	Result	Units	Lower Limit	Upper Limit	Violation
BTU, Moisture-Ash Free	14479	BTU/Lb.			
Hardgrove Grindability Index	54	HGI			
Pounds SO2 / Million BTU	4.84	Lbs. SO2/MMBTU			
Sulfur in Ash	1.56	%			
Total Moisture	12.9	%			

Ash Fusion Analysis	Result	Units	Lower Limit	Upper Limit	Violation
Ash Fusion, FT, Reducing	2230	Degrees F			
Ash Fusion, HT, Reducing	2050	Degrees F			
Ash Fusion, IT, Reducing	1960	Degrees F			
Ash Fusion, ST, Reducing	2000	Degrees F			

E-2 FUEL BLEND COMPOSITES

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Wednesday, March 22, 2000

Report For: John McDaniel, Polk Power
Martin Duff, Fuels Dept.

Sample Information

Sample ID: **AA53383**
Location Code: SPECL-PK
Location Description: Test Burn (petcoke/coal)
Composite For: Petcoke Blend Test
Lab Supplying Sample: CTE St. Rose

Lab Submittal Date: 01/26/00
Sample Collection Date: 01/25/00
Sample Collector: SGS
Shipment No.: 8690
Supplier lab ID. Number: 1414-40

Laboratory Results

Ash Mineral Analysis	Result	Units	Lower Limit	Upper Limit	Violation
Aluminum Oxide, Al2O3	23.15	%			
Base/Acid Ratio	0.305				
Calcium Oxide, CaO	5.73	%			
Fouling Index for Bituminous Ash	0.278				
Fouling Tendency for Bituminous Ash	Medium				
Iron Oxide, Fe2O3	12.80	%			
Magnesium Oxide, MgO	0.95	%			
Phosphorus, P2O5	0.34	%			
Potassium Oxide, K2O	1.61	%			
Silica Value	71.1	%			
Silicon Dioxide, SiO2	47.98	%			
Slagging Index for Bituminous Ash	1.034				
Slagging Tendency for Bituminous Ash	Medium				
Sodium Oxide, Na2O	0.91	%			
Sulfur Trioxide, SO3	2.20	%			
T250	2540	Degrees F			
Titanium Dioxide, TiO2	1.08	%			
Undetermined, Ash Minerals	3.25	%	-5	5	

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Coal Analysis - As Received	Result	Units	Lower Limit	Upper Limit	Violation
Ash, as Received	4.58	%			
BTU, as Received	13443	BTU/Lb			
Carbon, as Received	76.33	%			
Fixed Carbon, as Received	64.95	%			
Hydrogen, as Received	4.17	%			
Nitrogen, as Received	1.49	%			
Oxygen, as Received	3.38	%			
Sulfur, as Received	3.16	%			
Volatiles, as Received	23.65	%			

Coal Analysis - Dry Basis	Result	Units	Lower Limit	Upper Limit	Violation
Ash, Dry Basis	4.91	%			
BTU, Dry Basis	14427	BTU/Lb.			
Carbon, Dry Basis	81.92	%			
Fixed Carbon, Dry Basis	69.71	%			
Hydrogen, Dry Basis	4.48	%			
Nitrogen, Dry Basis	1.60	%			
Oxygen, Dry Basis	3.63	%			
Sulfur, Dry Basis	3.39	%			
Volatiles, Dry Basis	25.38	%			

Coal Analysis - Miscellaneous	Result	Units	Lower Limit	Upper Limit	Violation
BTU, Moisture-Ash Free	15172	BTU/Lb.			
Hardgrove Grindability Index	58	HGI			
Pounds of Ash / Million BTU	3.406	Lbs./MMBTU			
Pounds SO2 / Million BTU	4.46	Lbs. SO2/MMBTU			
Sulfur in Ash	0.88	%			
Total Moisture	6.82	%			
Vanadium in Ash	1.28	%			

Ash Fusion Analysis	Result	Units	Lower Limit	Upper Limit	Violation
Ash Fusion, FT, Reducing	2370	Degrees F			
Ash Fusion, HT, Reducing	2300	Degrees F			
Ash Fusion, IT, Reducing	2195	Degrees F			
Ash Fusion, ST, Reducing	2240	Degrees F			

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Comments:

This sample is approx. 40% petcoke and 60% coal.
Barge: Peggy Palmer

APPENDIX F

FIELD DATA SHEETS

F-1 BASELINE SULFURIC ACID DATA SHEETS

F-2 BASELINE ORSAT DATA SHEETS

F-3 FUEL BLEND SULFURIC ACID MIST DATA SHEETS

F-4 FUEL BLEND ORSAT DATA SHEETS

F-1 BASELINE SULFURIC ACID DATA SHEETS

Sulfuric Acid Mist Field Data Form

Plant: Pick Power Station
Location: Unit #1
Date: 2-7-00
Method No.: 8
Run No.: Base-1
Box Operator: RAB / CVC
Probe Operator: RAB / RAM
Time - Start: 10:17 End: 11:25
Sampling Time: 60
Min.\ Pt.: 2.5
Meter Box No.: 6
Stack Area Ft.³: 283.529
Meter Cal. (ΔH): 1.780
Meter Cal. (ΔY): 0.989

Nozzle I.D. No.: #47 0.201
Nozzle Diameter: 0.201 "
Pitot Tube No.:
Pitot Tube (C_p): 0.84
Probe Length: 14"
Probe Liner Material: Pyrex
Probe Heater Setting: 250
Pressure: Pb ("Hg): 30.05 Pg ("H20): 0.52 Ps ("Hg): 29.98
Ambient Temperature: 70°F
Assumed Moisture (%): 7.0
Filter Holder No.:
Comments: Baseline test

Dry Gas Meter Volume
Final: 148.326 Ft.³
Initial: 107.402 Ft.³
Net: 40.924 Ft.³

Equipment Leak Checks
Initial: 0.000 CFM @ 15 "Hg
Final: 0.000 CFM @ 5 "H20
Pitot Tube: OK @ 6.7 "H20

Moisture Determination
Impinger: 16 ml
Silica Gel: 24.6 gm
Total: 40.6

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:17	109.2	1.45	1.51	235	336	74	270	63	5
2		111.0	1.45	1.51	235	335	77	267	62	5
3		112.8	1.45	1.51	230	336	78	270	62	5
4		114.4	1.45	1.51	240	335	79	270	62	5
5		116.2	1.45	1.51	239	335	79	270	63	5
6	10:32	117.8	1.25	1.30	237	334	80	267	64	5
1	10:35	119.6	1.45	1.51	235	334	78	267	62	5
2		121.3	1.45	1.51	228	336	80	265	63	5
3		123.1	1.45	1.51	229	336	82	265	64	5
4		124.8	1.45	1.51	228	336	83	266	65	5
5		126.5	1.45	1.51	226	336	84	274	64	5
6	11:00	128.1	1.25	1.30	228	335	85	276	64	5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:52	129.8	1.30	1.36	236	335	84	277	63	5
2		131.5	1.35	1.41	238	336	85	276	63	5
3		133.1	1.35	1.41	238	336	86	276	64	5
4		134.9	1.35	1.41	242	337	87	278	65	5
5		136.5	1.35	1.41	244	336	88	278	65	5
6	11:07	138.1	1.20	1.25	238	334	88	277	65	5
1	11:10	139.8	1.30	1.36	226	335	86	273	64	5
2		141.5	1.35	1.41	227	336	88	275	64	5
3		143.3	1.40	1.46	224	337	89	274	64	5
4		145.0	1.40	1.46	220	338	89	274	64	5
5		146.7	1.40	1.46	219	337	89	271	65	5
6	11:25	148.326	1.30	1.36	217	337	89	276	65	5

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201	Final	199.456 Ft³
Date	2-7-00	Pitot Tube No.		Initial	157.824 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.736 Ft³
Run No.	Base-2	Probe Length	14 Ft		
Box Operator	RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	15.0 in
Probe Operator	CWC/RAM	Probe Heater Setting	250	Initial	0.000 CFM @ ~~4.6~~ "Hg
Time - Start:	13:36 End: 14:42	Pressure	Pb ("Hg): 30.00 Pg ("H2O): -0.92 Ps ("Hg): 29.93	Final	0.000 CFM @ 8.0 "H2O
Sampling Time	60	Ambient Temperature	75 Windy	Pitot Tube	OK @ 4.6 "H2O
Min.\ Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline	Impinger	34 ml
Meter Cal. (ΔH)	~~ΔP 0.7~~ 1.780			Silica Gel	15.1 gm
Meter Cal. (ΔY)	0.989			Total	49.1

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	13:36	159.6	1.35	1.42	180	335	75	263	62	8
2		161.3	1.35	1.42	180	335	78	267	62	7
3		163.0	1.35	1.42	178	335	79	270	57	7
4		164.7	1.40	1.48	182	336	80	268	56	7
5		166.5	1.45	1.53	196	336	81	270	55	8
6	13:51	168.2	1.30	1.37	190	334	81	268	55	7
1	13:53	169.9	1.35	1.42	206	331	80	270	57	7
2		171.6	1.35	1.42	211	336	81	269	55	7
3		173.3	1.35	1.42	216	336	81	270	54	7
4		175.0	1.40	1.48	213	337	82	271	55	7
5		176.8	1.45	1.53	223	336	83	268	56	7
6	14:08	178.6	1.30	1.37	232	335	84	270	56	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	14:10	180.3	1.40	1.48	240	334	84	270	58	7
2		182.0	1.45	1.53	245	336	87	271	57	7
3		183.8	1.45	1.53	241	335	88	274	57	7
4		185.6	1.45	1.53	246	335	89	274	57	7
5		187.3	1.45	1.53	217	334	89	273	58	7
6	14:25	189.0	1.30	1.37	201	333	87	273	59	7
1	14:27	190.8	1.40	1.48	205	333	85	270	59	7
2		192.5	1.45	1.53	210	334	84	268	58	7
3		194.2	1.45	1.53	223	334	85	269	57	7
4		196.0	1.45	1.53	226	335	86	271	58	7
5		197.8	1.45	1.53	234	335	87	271	58	7
6	14:42	199.456	1.30	1.37	232	333	88	269	59	7

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station
Location	Unit #1
Date	2-7-00
Method No.	8
Run No.	Base-3
Box Operator	RAD
Probe Operator	CVC / RAM
Time - Start	15:36 End: 16:45
Sampling Time	60
Min.\ Pt.	2.5
Meter Box No.	6
Stack Area Ft³	283.529
Meter Cal. (ΔH)	1.760
Meter Cal. (ΔY)	0.989

Nozzle I.D. No.	#47
Nozzle Diameter	0.201
Pitot Tube No.	
Pitot Tube (C_p)	0.84
Probe Length	14.0 FT
Probe Liner Material	Pyrex
Probe Heater Setting	250°F
Pressure	Pb ("Hg): 30.00 Pg ("H2O): -.92 Ps ("Hg): 29.93
Ambient Temperature	82
Assumed Moisture (%)	7.0
Filter Holder No.	
Comments	Baseline

Dry Gas Meter Volume

Final	251.380	Ft³
Initial	209.725	Ft³
Net	41.655	Ft³

Equipment Leak Checks

Initial	0.002 CFM @ 15 "Hg
Final	0.000 CFM @ 10 "H2O
Pitot Tube	OK @ 4.6 "H2O

Moisture Determination

Impinger	30	ml
Silica Gel	16.8	gm
Total	46.8	

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:36	211.5	1.40	1.48	221	333	81	271	63	10
2		213.3	1.45	1.53	196	334	84	267	59	9
3		215.1	1.45	1.53	193	334	85	268	59	9
4		216.9	1.45	1.53	191	334	86	268	59	9
5		218.6	1.45	1.53	201	334	85	270	59	9
6	15:51	220.2	1.30	1.37	198	332	86	270	60	9
1	15:53	222.0	1.45	~~1.48~~ 1.53	206	331	84	269	61	9
2		223.8	1.45	1.53	205	332	85	272	59	9
3		225.5	1.45	1.53	200	331	86	272	60	9
4		227.3	1.45	1.53	188	332	86	272	61	9
5		229.0	1.45	1.53	181	332	86	269	61	9
6	16:08	230.7	1.30	1.37	197	331	86	270	62	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	16:12	232.5	1.35	1.42	192	334	81	270	62	9
2		234.2	1.35	1.42	191	334	82	271	60	9
3		235.9	1.35	1.42	189	333	82	271	59	9
4		237.6	1.35	1.42	186	334	82	272	61	9
5		239.3	1.35	1.42	182	334	82	268	61	9
6	16:27	241.1	1.30	1.37	177	333	82	271	62	9
1	16:30	242.7	1.35	1.42	163	332	79	268	62	9
2		244.5	1.35	1.42	160	334	80	266	60	9
3		246.2	1.35	1.42	165	334	80	265	61	9
4		247.9	1.40	1.48	164	334	80	268	61	9
5		249.7	1.40	1.48	161	334	80	267	61	9
6	16:45	251.380	1.30	1.37	161	333	80	269	61	9

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	303.408 Ft.³
Date	2-7-00	Pitot Tube No.		Initial	261.925 Ft.³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.483 Ft.³
Run No.	Base-4	Probe Length	14 FT		
Box Operator	RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAM / DAS	Probe Heater Setting	250	Initial	0.000 CFM @ 15 "Hg
Time - Start:	17:37 End: 18:45	Pressure	Pb ("Hg): 29.95 Pg ("H20): -.92 Ps ("Hg): 29.88	Final	0.000 CFM @ 8 "H20
Sampling Time	60	Ambient Temperature	71	Pitot Tube	OK, @ 4.6 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft.³	283.529	Comments	Baseline	Impinger	31 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20.4 gm
Meter Cal. (ΔY)	0.989			Total	51.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	17:37	263.8	1.35	1.41	160	333	72	260	61	~~10~~8
2		265.4	1.35	1.41	164	333	74	264	55	1~~0~~8
3		267.1	1.35	1.41	165	333	75	268	56	8
4		268.9	1.40	1.46	166	332	76	267	57	8
5		270.6	1.40	1.46	167	331	76	267	58	8
6	17:52	272.2	1.30	1.36	171	330	76	266	58	8
1	17:55	273.9	1.35	1.41	187	330	74	270	58	8
2		275.6	1.35	1.41	194	331	75	271	57	8
3		277.3	1.35	1.41	194	331	75	267	57	8
4		279.0	1.40	1.46	196	331	75	270	58	8
5		280.7	1.35	1.41	197	332	75	267	58	8
6	18:10	282.4	1.30	1.36	195	331	75	268	59	8

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	18:13	284.2	1.40	1.46	180	331	73	268	58	8
2		286.0	1.45	1.51	175	333	73	270	58	8
3		287.7	1.45	1.51	170	333	74	266	59	8
4		289.5	1.45	1.51	169	332	73	267	60	8
5		291.2	1.45	1.51	164	332	73	265	60	8
6	18:28	292.9	1.30	1.36	162	329	73	266	61	7
1	18:30	294.6	1.40	1.46	165	330	71	272	60	8
2		296.2	1.45	1.51	164	332	71	271	59	8
3		298.2	1.45	1.51	164	331	71	268	60	8
4		299.9	1.45	1.51	166	331	71	271	61	8
5		301.7	1.45	1.51	167	330	71	270	61	8
6	18:45	303.408	1.30	1.36	166	329	71	267	62	7

Sulfuric Acid Mist Field Data Form

Plant	POLK POWER STATION	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	UNIT #1	Nozzle Diameter	0.201"	Final	353.510 Ft³
Date	2-8-00	Pitot Tube No.		Initial	312.713 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	40.797 Ft³
Run No.	BASE-5	Probe Length	14.0 Ft		
Box Operator	RAM/CVC	Probe Liner Material	PYREX	Equipment Leak Checks	
Probe Operator	CVC/RAM	Probe Heater Setting	250 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	8:17 End: 9:37	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.40 Ps ("Hg): 29.88	Final	0.000 CFM @ 12 "H20
Sampling Time	60	Ambient Temperature	58 °F	Pitot Tube	OK @ 7.7 "H20
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	BASELINE	Impinger	29 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20.2 gm
Meter Cal. (ΔY)	0.989			Total	49.2

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	8:17	314.4	1.45	1.48	170	336	55	268	50	10
2		316.1	1.45	1.48	169	336	56	268	49	10
3		317.8	1.45	1.48	168	336	57	269	49	10
4		319.5	1.45	1.48	173	336	58	271	50	10
5		321.2	1.45	1.48	174	335	59	269	52	10
6	8:32	322.8	1.30	1.33	174	334	60	273	53	9
1	8:35	~~326.2~~ 324.1	1.45	1.48	188	336	60	268	52	10
2		326.2	1.45	1.48	194	336	60	263	53	10
3		327.8	1.45	1.48	194	336	60	253	54	10
4		329.6	1.45	1.48	202	336	60	256	51	10
5		331.3	1.45	1.48	211	336	62	261	52	10
6	8:58	332.9	1.20	1.22	214	334	63	269	54	8

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P R (In. H_2O)	Δ H 0 (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	9:03	334.6	1.30	1.33	192	337	62	269	55	10
2		336.3	1.30	1.33	187	337	63	266	54	10
3		337.9	1.30	1.33	183	337	64	266	54	10
4		339.6	1.30	1.33	182	336	64	266	56	10
5		341.4	1.30	1.33	177	336	65	269	57	10
6	9:18	343.0	1.20	1.22	175	334	65	269	58	10
						~~334~~ cvc	~~62~~ cvc	~~269~~ cvc		
1	9:22	~~343.0~~	1.30	1.33	190	334	62	269	56	10
2		344.7	1.30	1.33	196	336	63	271	56	10
3		346.3	1.34	1.37	1.99	336	64	273	57	~~12~~ 10 cvc
4		348.1	1.34	1.37	199	336	64	273	58	~~12~~ 10 cvc
5		350.0	1.34	1.37	195	336	64	273	59	12
6	9:37	351.9	1.10	1.12	197	334	64	273	59	10
		353.510								

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	404.392 Ft.³
Date	2-8-00	Pitot Tube No.		Initial	363.509 Ft.³
Method No.	8	Pitot Tube (C_p)	0.84	Net	40.883 Ft.³
Run No.	Base-6	Probe Length	14.0 ft		
Box Operator	CVC/RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAB/RAM/CVC	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	10:18 End: 1127	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.90 Ps ("Hg): 29.88	Final	0.000 CFM @ 11 "H2O
Sampling Time	60	Ambient Temperature	58°F	Pitot Tube	OK @ 7.7 "H2O
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline-6	Impinger	26 ml
Meter Cal. (ΔH)	1.780			Silica Gel	22.3 gm
Meter Cal. (ΔY)	0.989			Total	48.3

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:18	365.3	1.40	1.43	187	336	61	260	55	11
2		367.0	1.30	1.33	190	336	62	259	53	11
3		368.7	1.30	1.33	195	336	63	263	54	10
4		370.4	1.40	1.43	194	336	64	266	55	10
5		372.1	1.40	1.43	199	336	64	270	56	10
6	10:33	373.8	1.30	1.33	198	335	65	273	56	10
1	10:35	375.5	1.30	1.33	179	334	64	274	56	11
2		377.1	1.30	1.33	173	337	65	273	56	11
3		378.7	1.30	1.33	179	337	65	270	57	11
4		380.4	1.30	1.33	180	336	66	273	58	11
5		382.1	1.30	1.33	181	336	66	272	59	10
6	10:50	383.7	1.20	1.22	173	334	67	271	61	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1054	385.4	1.40	1.43	193	335	66	273	60	10
2		387.2	1.40	1.43	198	335	67	273	59	10
3		388.9	1.40	1.43	202	336	68	270	60	10
4		390.6	1.40	1.43	193	335	69	273	61	10
5		392.3	1.40	1.43	193	335	69	269	63	10
6	1109	393.9	1.20	1.22	198	335	69	273	63	9
1	1112	395.7	1.40	1.43	203	336	67	270	62	10
2		397.4	1.40	1.43	199	336	69	269	59	10
3		399.1	1.50	1.53	207	336	70	272	61	11
4		400.9	1.50	1.53	205	336	70	272	61	11
5		402.7	1.50	1.53	209	336	71	271	62	11
6	1127	404.392	1.30	1.33	204	335	72	269	63	10

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	456.063 Ft.³
Date	2-8-00	Pitot Tube No.		Initial	415.075 Ft.³
Method No.	8	Pitot Tube (C_p)	0.84	Net	cvc ~~2~~ 40.988 Ft.³
Run No.	Base-~~1~~ Ev. 7	Probe Length	14.0 ft		
Box Operator	CVC / RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAM / RAB / CVC	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	1216 End: 1324	Pressure	Pb ("Hg): 30.00 Pg ("H20): -.40 Ps ("Hg): 29.88	Final	0.000 CFM @ 12 "H20
Sampling Time	60	Ambient Temperature	60°F	Pitot Tube	OK @ 7.7 "H20
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline - 7	Impinger	26 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20 gm
Meter Cal. (ΔY)	0.989			Total	46

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1216	416.8	1.40	1.46	233	337	73	269	59	11
2		418.5	1.40	1.46	208	337	76	268	57	11
3		420.2	1.40	1.46	209	336	76	269	56	11
4		422.0	1.40	1.46	191	336	76	269	57	11
5		423.7	1.40	1.46	192	336	76	269	57	11
6	1231	425.4	1.30	1.35	201	335	76	270	57	11
1	1233	427.1	1.40	1.46	202	336	75	275	60	12
2		428.9	1.40	1.46	196	336	75	271	59	12
3		430.6	1.40	cvc ~~1.42~~ 1.46	203	336	74	270	60	12
4		432.3	1.40	1.46	207	337	74	271	61	12
5		434.1	1.40	1.46	219	336	74	271	61	12
6	1248	435.7	1.20	1.25	226	334	74	273	62	10

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1251	437.4	1.30	1.35	198	336	73	270	64	11
2		439.0	1.20	1.25	203	336	74	271	61	10
3		440.7	1.30	1.35	204	336	74	271	61	11
4		442.4	1.40	1.46	209	336	75	270	63	12
5		444.2	1.40	1.46	210	336	75	269	64	12
6	1306	445.8	1.20	1.25	215	335	75	270	64	10
1	1309	447.5	1.30	1.35	219	336	74	273	66	11
2		449.2	1.30	1.35	220	337	75	269	61	11
3		450.9	1.30	1.35	233	337	75	272	62	11
4		452.6	1.40	1.46	230	337	76	272	62	12
5		454.4	1.40	1.46	238	336	77	269	63	12
6	1324	456.063	1.20	1.25	237	335	77	268	63	10

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit 41	Nozzle Diameter	0.201"	Final	507.654 Ft³
Date	2-8-00	Pitot Tube No.		Initial	466.368 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.286 Ft³
Run No.	Base-8	Probe Length	14.0 ft		
Box Operator	CVC/RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	RAM/RAB/CVC	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start:	1404 End: 1512	Pressure	Pb ("Hg): 29.91 Pg ("H2O): -.90 Ps ("Hg): 29.84	Final	0.000 CFM @ 12 "H2O
Sampling Time	60	Ambient Temperature	60°F	Pitot Tube	OK @ 7.7 "H2O
Min.\Pt.	2.5	Assumed Moisture (%)	7.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Baseline	Impinger	26 ml
Meter Cal. (ΔH)	1.780			Silica Gel	20.4 gm
Meter Cal. (ΔY)	0.989			Total	46.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1404	468.0	1.30	1.35	188	336	74	266	61	10
2		469.7	1.30	1.35	191	337	76	270	58	10
3		471.4	1.40	1.46	201	337	77	271	57	10
4		473.1	1.40	1.46	214	337	78	272	58	11
5		474.9	1.40	1.46	223	336	79	272	60	11
6	1419	476.6	1.30	1.35	224	335	80	270	60	10
1	14:21	478.3	1.30	1.35	218	336	78	269	62	10
2		480.0	1.30	1.35	225	336	79	269	60	10
3		481.6	1.30	1.35	232	336	80	273	60	10
4		483.3	1.35	1.40	225	336	81	271	61	10
5		485.0	1.40	1.46	220	336	81	269	62	11
6	14:36	486.6	1.25	1.30	230	335	82	272	62	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	1439	488.3	1.30	1.35	221	335	81	273	65	10
2		490.1	1.40	1.46	222	336	82	274	64	11
3		491.8	1.40	1.46	211	336	82	272	67	11
4		493.5	1.40	1.46	209	336	83	275	67	11
5		495.3	1.40	1.46	213	336	84	271	67	11
6	1454	496.9	1.20	1.25	223	334	84	272	66	10
1	1457	498.8	1.40	1.46	215	337	82	271	65	11
2		500.5	1.40	1.46	213	337	84	274	62	11
3		502.3	1.50	1.56	211	336	84	270	62	12
4		504.2	1.50	1.56	212	336	84	272	63	12
5		505.9	1.50	1.56	223	336	84	270	62	12
6	1512	507.654	1.30	1.35	228	335	85	269	62	10

F-2 BASELINE ORSAT DATA SHEETS

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Pock Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
Base-1	2-7-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.2	80.2	80.2	80.2	
Base-2	2-7-00 RAB	CO2	8.2	8.2	8.2	8.2	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
Base-3	2-7-00 RAB	CO2	8.2	8.2	8.2	8.2	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location POLK POWER STATION

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
BASE 4	2-7-00 BAP	CO2	8.4	8.4	8.4	8.4	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	79.8	79.8	79.8	79.8	
		CO2					
		O2					
		CO					
		N2					
		CO2					
		O2					
		CO					
		N2					

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Polk Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume) 1	2	3	Avg.	Remarks
BASE-5	2-8-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
BASE-6	2-8-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
BASE-7	2-8-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.2	80.2	80.2	80.2	

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Pock Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
Base-8	2-8-00 RAD	CO2	8.0	8.0	8.0	8.0	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.2	80.2	80.2	80.2	
Base-9		CO2					
		O2					
		CO					
		N2					
		CO2					
		O2					
		CO					
		N2					

F-3 FUEL BLEND SULFURIC ACID MIST DATA SHEETS

Sulfuric Acid Mist Field Data Form

Plant	POLK POWER	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	UNIT #1	Nozzle Diameter	0.201	Final	585.702 Ft³
Date	2-14-00	Pitot Tube No.	C0122	Initial	544.483 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.219 Ft³
Run No.	BLEND 1 RUN 1	Probe Length	14.0		
Box Operator	RAS	Probe Liner Material	PYREX	Equipment Leak Checks	
Probe Operator	CD / BB	Probe Heater Setting	250 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	09:43 End: 10:52	Pressure	Pb ("Hg): 29.80 Pg ("H2O): -.80 Ps ("Hg): 29.74	Final	0.000 CFM @ 8 "H2O
Sampling Time	60	Ambient Temperature	70	Pitot Tube	OK @ 4.5 "H2O
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0 %		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	1ST BLEND TEST PETCOKE	Impinger	~~68~~ 32 ml
Meter Cal. (ΔH)	1.780		VERY WINDY!	Silica Gel	22.4 gm
Meter Cal. (ΔY)	0.989			Total	54.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	09:43	546.4	1.25	1.34	170	323	74	263	59	7
2		548.0	1.30	1.39	171	324	74	262	59	7
3		549.6	1.30	1.39	171	325	75	267	59	7
4		551.2	1.30	1.39	171	324	75	270	60	7
5		553.1	1.30	1.39	169	325	75	273	62	7
6	09:58	554.8	1.20	1.29	168	323	75	273	63	6
1	10:02	556.5	1.25	1.34	171	321	75	278	63	7
2		558.1	1.30	1.39	175	323	75	275	63	7
3		559.7	1.30	1.39	158	323	76	275	62	7
4		561.4	1.30	1.39	150	324	76	276	63	7
5		563.2	1.35	1.45	148	323	76	275	63	8
6	10:17	564.8	1.20	1.29	150	320	76	276	64	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:19	566.6	~~1.40~~ 1.35 [illegible]	1.45	165	323	76	271	63	7
2		568.3	1.35	1.45	164	323	76	269	63	7
3		570.2	1.40	1.50	169	322	76	268	63	8
4		571.9	1.40	1.50	169	322	76	268	64	8
5		573.7	1.40	1.50	170	322	77	268	66	8
6	10:34	575.3	1.15	1.23	170	320	77	267	66	6
1	10:37	577.3	1.45	1.55	157	323	77	268	66	8
2		578.6	1.45	1.55	158	323	77	269	66	8
3		580.3	1.45	1.55	162	323	77	270	67	8
4		582.2	1.45	1.55	160	322	78	271	67	8
5		584.1	1.45	1.55	161	322	78	272	67	8
6	10:52	585.702	1.20	1.29	161	321	78	273	67	6

Sulfuric Acid Mist Field Data Form

Plant	Pock Power	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	.201	Final	639,826 Ft³
Date	2-14-00	Pitot Tube No.	00122	Initial	597.695 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	42,131 Ft³
Run No.	Blend 1 Run 2	Probe Length	14.0		
Box Operator	RB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	BB / CD	Probe Heater Setting	250 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	11:44 End: 12:54	Pressure	Pb ("Hg): 29.80 Pg ("H20): -.80 Ps ("Hg): 29.74	Final	0.000 CFM @ 10 "H20
Sampling Time	60	Ambient Temperature	75 °F	Pitot Tube	OK @ 46 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0 %		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Blend 1 Run 2 Petcoke	Impinger	32 ml
Meter Cal. (ΔH)	1.780		Very, Very windy!	Silica Gel	25.4 gm
Meter Cal. (ΔY)	0.989			Total	57.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	11:44	599.5	1.35	1.45	153	321	78	260	65	10
2		601.2	1.40	1.50	160	322	78	260	64	10
3		603.1	1.45	1.55	160	322	79	269	64	10
4		604.8	1.45	1.55	159	322	79	272	64	10
5		606.7	1.45	1.55	159	322	79	275	63	10
6	11:59	608.4	1.40	1.50	159	323	80	273	64	10
1	12:02	610.2	1.40	1.50	157	321	79	276	65	10
2		612.0	1.40	1.50	154	323	79	275	65	10
3		613.1	1.40	1.50	159	322	80	274	65	10
4		615.4	1.45	1.55	158	322	80	275	64	10
5		617.3	1.40	1.50	159	323	80	275	63	10
6	12:17	619.0	1.20	1.29	159	321	80	272	63	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	12:21	620.7	1.25	1.34	178	322	80	278	65	9
2		622.4	1.30	1.39	178	321	80	278	65	9
3		624.1	1.30	1.39	150	322	80	277	65	9
4		625.9	1.40	1.50	153	322	80	277	66	9
5		627.6	1.40	1.50	151	322	80	278	66	9
6	12:36	629.4	1.30	1.39	149	322	80	277	66	9
1	12:39	631.2	1.35	1.45	159	321	79	278	66	9
2		632.9	1.35	1.45	161	321	80	278	66	9
3		634.6	1.40	1.50	160	322	80	275	65	9
4		636.4	1.40	1.50	164	323	80	274	65	9
5		638.2	1.30	1.39	164	320	80	275	66	9
6	12:54	639.826	1.20	1.29	160	320	80	276	66	8

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201	Final	691.642 Ft³
Date	2-14-00	Pitot Tube No.	00122	Initial	~~65~~ 650.186 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.456 Ft³
Run No.	Blend 1 - Run 3	Probe Length	14.0 Ft		
Box Operator	AAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	BB / CD	Probe Heater Setting	250 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	13:41 End: 14:51	Pressure	Pb ("Hg): 29.75 Pg ("H2O): -0.80 Ps ("Hg): 29.69	Final	0.000 CFM @ 11 "H2O
Sampling Time	60	Ambient Temperature	75 °F	Pitot Tube	OK @ 4.6 "H2O
Min.\Pt.	2.5	Assumed Moisture (%)	6.0%		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Blend 1 Run 3 Petcoke	Impinger	~~20~~ 30 ml
Meter Cal. (ΔH)	1.780		Very windy!	Silica Gel	20.2 ~~25.4~~ gm
Meter Cal. (ΔY)	0.989			Total	50.2 ~~55.4~~

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	13:41	652.0	1.30	1.39	165	321	79	277	64	10
2		653.6	1.30	1.39	164	321	79	278	64	10
3		655.4	1.40	1.50	165	320	80	278	62	10
4		657.1	1.40	1.50	164	320	80	278	62	10
5		658.9	1.40	1.50	162	320	80	276	63	10
6	13:56	660.5	1.20	1.29	161	320	80	273	63	9
1	13:59	662.2	1.30	1.39	165	321	79	275	65	10
2		663.9	1.30	1.39	164	321	80	276	63	10
3		665.6	1.30	1.39	159	321	80	275	63	10
4		667.3	1.35	1.45	152	320	80	274	63	10
5		669.2	1.40	1.50	151	321	80	276	64	11
6	14:14	670.8	1.20	1.29	150	320	80	278	65	9

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	14:18	672.5	1.30	1.39	160	320	79	274	65	10
2		674.2	1.30	1.39	159	320	80	277	64	10
3		675.9	1.35	1.45	160	320	80	278	64	10
4		677.7	1.40	1.50	163	320	80	271	64	11
5		679.5	1.40	1.50	162	320	80	271	64	11
6	14:33	681.1	1.20	1.29	162	320	80	272	64	9
1	14:36	682.9	1.40	1.50	161	320	80	277	65	11
2		684.6	1.40	1.50	160	322	80	276	64	11
3		686.5	1.40	1.50	162	322	80	276	65	11
4		688.2	1.40	1.50	163	321	80	276	66	11
5		690.0	1.40	1.50	163	321	80	275	66	11
6	14:51	691.642	1.20	1.29	165	319	80	275	67	9

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Run No. Blend 1 Run ~~2~~ 3 Page 2 of ~~2~~ ~~3~~ 2

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Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201"	Final	743.396 Ft³
Date	2-4-00	Pitot Tube No.	00122	Initial	701.875 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.521 Ft³
Run No.	Blend 1 Run 4	Probe Length	14.0'		
Box Operator	RAD	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	BB / CD	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start	15:32 End: 16:38	Pressure	Pb ("Hg): 29.70 Pg ("H2O): -0.80 Ps ("Hg): 29.64	Final	0.000 CFM @ 7 "H20
Sampling Time	60	Ambient Temperature	75°F	Pitot Tube	OK @ 4.6 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Blend 1 Run 4 Pericoike	Impinger	34 ml
Meter Cal. (ΔH)	1.780		Very windy	Silica Gel	~~20.2~~ BR 19.4 gm
Meter Cal. (ΔY)	0.989			Total	~~54.2~~ 53.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:32	703.7	1.40	1.50	162	320	79	267	62	~~8~~ 7
2		705.4	1.40	1.50	164	320	80	263	58	7
3		707.2	1.40	1.50	167	319	80	268	57	7
4		709.0	1.40	1.50	170	319	81	273	58	7
5		710.7	1.40	1.50	172	319	81	276	59	7
6	15:47	712.4	1.20	1.29	174	318	81	276	60	6
1	15:49	714.2	1.35	1.45	168	319	80	278	60	7
2		715.9	1.35	1.45	169	320	80	279	60	7
3		717.7	1.40	1.50	170	321	81	275	60	7
4		719.4	1.40	1.50	169	321	81	276	61	7
5		721.2	1.40	1.50	168	321	81	275	61	7
6	16:04	722.9	1.20	1.29	165	320	81	278	62	6

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	16:06	724.6	1.30	1.39	182	320	80	278	62	7
2		726.3	1.30	1.39	182	320	80	277	62	7
3		728.0	1.30	1.39	179	320	80	278	62	7
4		729.7	1.35	1.45	175	320	80	278	63	7
5		731.4	1.30	1.~~8~~ 39	173	320	80	278	63	7
6	16:21	733.1	1.15	1.23	173	319	81	274	63	6
1	16:23	734.8	1.30	1.39	177	321	80	280	62	7
2		736.5	1.30	1.39	180	321	80	276	63	7
3		738.2	1.30	1.39	178	320	80	277	63	7
4		740.0	1.40	1.50	178	321	80	278	63	7
5		741.8	1.40	1.50	177	320	80	279	64	7
6	16:38	743.396	1.20	1.29	175	319	80	274	64	6

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201	Final	792.970 Ft³
Date	2-15-00	Pitot Tube No.	00122	Initial	~~752.363~~ 752.463 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	40.507 Ft³
Run No.	Blend 1 Run 5	Probe Length	14.0 Ft		
Box Operator	PAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	BB 1 CD	Probe Heater Setting	250°F	Initial	0.000 CFM @ 15 "Hg
Time - Start	8:44 End: 9:50	Pressure	Pb ("Hg): 29.90 Pg ("H20): -.83 Ps ("Hg): 29.84	Final	0.000 CFM @ 9 "H20
Sampling Time	60	Ambient Temperature	67°F	Pitot Tube	OK @ 7.2 "H20
Min.\ Pt.	2.5	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Blend 1 Run 5 Petcoke	Impinger	34 ml
Meter Cal. (ΔH)	1.780		Clear, Mild	Silica Gel	21.2 gm
Meter Cal. (ΔY)	0.989			Total	55.2

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	8:44	754.2	1.30	~~1.39~~ 1.41	230	317	72	270	60	8
2		755.8	1.30	1.41	229	317	74	271	60	8
3		757.5	1.35	1.47	224	317	75	274	59	9
4		759.2	1.30	1.41	215	318	76	275	59	8
5		760.9	1.30	1.41	199	319	77	275	59	8
6	08:59	762.6	1.20	1.30	196	318	78	272	60	8
1	9:01	764.3	1.30	1.41	198	316	76	271	59	8
2		765.9	1.30	1.41	201	317	76	273	58	8
3		767.6	1.25	1.36	200	317	76	275	58	8
4		769.3	1.30	1.41	201	317	76	275	58	8
5		771.0	1.30	1.41	203	317	76	277	59	8
6	9:16	772.6	1.15	1.25	202	316	76	278	59	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	9:18	774.3	1.35	1.47	197	316	74	280	59	9
2		776.0	1.35	1.47	197	317	75	278	59	9
3		777.7	1.35	1.47	190	317	76	275	60	9
4		779.5	1.35	1.47	192	317	76	278	60	9
5		781.2	1.30	1.41	195	317	77	279	60	8
6	9:33	782.7	1.10	1.19	195	317	77	278	60	7
1	9:35	784.4	1.35	1.47	208	320	77	275	62	9
2		786.2	1.35	1.47	209	320	77	276	61	9
3		787.9	1.35	1.47	210	320	78	278	61	9
4		789.6	1.35	1.47	219	320	79	279	61	9
5		791.3	1.35	1.47	221	320	79	276	62	9
6	9:50	792.970	1.20	1.30	220	319	80	278	63	8

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201	Final	843.261 Ft³
Date	2-15-00	Pitot Tube No.	60122	Initial	802.159 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	41.102 Ft³
Run No.	Blend 1 Run 6	Probe Length	14.0 ft		
Box Operator	RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	BB/CO	Probe Heater Setting	250	Initial	0.000 CFM @ 15 "Hg
Time - Start	10:23 End: 11:29	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.83 Ps ("Hg): 29.89	Final	0.000 CFM @ 7 "H2O
Sampling Time	60	Ambient Temperature	75 °F	Pitot Tube	OK @ 7.2 "H2O
Min.\Pt.	2.5	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Blend 1 Run 6 Petcoke	Impinger	42 ml
Meter Cal. (ΔH)	1.780		Clear, Mild	Silica Gel	21 gm
Meter Cal. (ΔY)	~~MY~~ 0.989			Total	63

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:23	803.9	1.30	1.41	202	319	76	253	60	7
2		805.6	1.30	1.41	200	319	78	260	60	7
3		807.3	1.35	1.47	203	319	80	261	58	7
4		809.1	1.35	1.47	199	319	80	268	58	7
5		810.8	1.35	1.47	193	318	81	273	59	7
6	10:38	812.5	1.20	1.30	191	317	81	275	59	6
1	10:40	814.2	1.35	1.47	196	318	80	275	60	7
2		815.9	1.35	1.47	190	320	81	278	60	7
3		817.7	1.35	1.47	185	321	81	280	60	7
4		819.4	1.35	1.47	182	321	82	279	61	7
5		821.2	1.40	1.52	186	321	83	278	61	7
6	10:55	822.8	1.15	1.25	184	320	84	275	62	6

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	10:57	824.5	1.30	1.41	200	319	83	279	62	7
2		826.2	1.30	1.41	205	320	84	276	62	7
3		827.9	1.30	1.41	213	320	85	278	62	7
4		829.6	1.35	1.47	216	320	87	276	63	7
5		831.3	1.30	1.41	216	320	87	276	64	7
6	11:12	832.9	1.15	1.25	213	319	87	276	64	6
1	11:14	834.6	1.25	1.36	197	318	86	280	64	7
2		836.3	1.30	1.41	195	319	88	277	62	7
3		838.1	1.30	1.41	189	319	89	276	62	7
4		839.8	1.35	1.47	191	319	90	277	62	7
5		841.6	1.35	1.47	184	318	90	277	63	7
6	11:29	843.261	1.20	1.30	184	318	91	280	63	6

Sulfuric Acid Mist Field Data Form

Plant	POLK POWER STATION
Location	UNIT #1
Date	2-15-00
Method No.	8
Run No.	BLEND 1 RUN ~~6~~ 7
Box Operator	RAB
Probe Operator	BB / CD
Time - Start	12:00 End: 13:06
Sampling Time	60
Min.\Pt.	2.5
Meter Box No.	6
Stack Area Ft^3	283.529
Meter Cal. (ΔH)	1.780
Meter Cal. (ΔY)	0.989

Nozzle I.D. No.	#47
Nozzle Diameter	0.201
Pitot Tube No.	00122
Pitot Tube (C_p)	0.84
Probe Length	14.0 FT
Probe Liner Material	PYREX
Probe Heater Setting	250°F
Pressure	Pb ("Hg): 30.05 Pg ("H20): -.83 Ps ("Hg): 29.99
Ambient Temperature	80°F
Assumed Moisture (%)	6.0
Filter Holder No.	
Comments	BLEND 1 RUN 7 PETCOKE CLEAR, WARM

Dry Gas Meter Volume		
Final	894.354	Ft^3
Initial	852.573	Ft^3
Net	41.781	Ft^3

Equipment Leak Checks		
Initial	0.000 CFM @ 15	"Hg
Final	0.000 CFM @ 7	"H20
Pitot Tube	OK @ 7.2	"H20

Moisture Determination		
Impinger	36	ml
Silica Gel	20.6	gm
Total	56.6	

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	12:00	854.3	1.25	1.38	178	319	90	270	62	7
2		856.1	1.30	1.44	180	319	91	271	61	7
3		857.8	1.40	1.55	188	320	93	276	61	7
4		859.6	1.35	1.49	193	321	94	280	61	7
5		861.4	1.35	1.49	199	321	95	279	62	7
6	12:15	863.1	1.20	1.33	206	320	96	280	62	6
1	12:17	864.8	1.25	1.38	212	319	95	277	63	7
2		866.5	1.30	1.44	216	320	96	279	63	7
3		868.2	1.30	1.44	226	320	97	280	63	7
4		869.9	1.30	1.44	225	319	97	279	63	7
5		871.7	1.30	1.44	224	319	97	276	63	7
6	12:32	873.3	1.15	1.27	230	318	97	276	63	6

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	12 ~~11~~:34 AM	874.9	1.35	1.49	215	319	96	276	64	7
2		876.8	1.35	1.49	215	319	96	280	64	7
3		878.7	1.35	1.49	216	319	97	280	64	7
4		880.4	1.35	1.49	202	320	97	277	64	7
5		882.2	1.35	1.49	198	320	97	276	64	7
6	12:49	883.9	1.20	1.33	205	319	97	277	64	6
1	12:51	885.6	1.35	1.49	203	319	96	276	64	7
2		887.3	1.35	1.49	202	320	96	275	65	7
3		889.2	1.35	1.49	199	319	96	276	65	7
4		891.0	1.35	1.49	201	318	96	276	65	7
5		892.7	1.30	1.44	211	318	95	278	65	7
6	13:06	894.354	1.15	1.27	214	316	95	276	66	6

Sulfuric Acid Mist Field Data Form

Plant	POLK POWER STATION
Location	Unit #1
Date	2-15-00
Method No.	8
Run No.	BLEND 1 RUN 8
Box Operator	RAB
Probe Operator	BB / CD
Time - Start	13:37 End: 14:42
Sampling Time	60
Min.\ Pt.	2.5
Meter Box No.	6
Stack Area Ft³	283.529
Meter Cal. (ΔH)	1.780
Meter Cal. (ΔY)	0.989

Nozzle I.D. No.	#47
Nozzle Diameter	0.201
Pitot Tube No.	00122
Pitot Tube (C_p)	0.84
Probe Length	14.0 FT
Probe Liner Material	PYREX
Probe Heater Setting	250 °F - 83
Pressure	Pb ("Hg): 29.45 Pg ("H2O): -~~.85~~ 1.0 Ps ("Hg): 29.89
Ambient Temperature	80°F
Assumed Moisture (%)	6.0 %
Filter Holder No.	
Comments	BLEND 1 RUN 8 PETCOKE CLEAR, WARM

Dry Gas Meter Volume

Final	945.635	Ft.³
Initial	903.815	Ft.³
Net	41.820	Ft.³

Equipment Leak Checks

Initial	0.000 CFM @ 15	"Hg
Final	0.000 CFM @ 7	"H2O
Pitot Tube	OK @ 7.2	"H2O

Moisture Determination

Impinger	51	ml
Silica Gel	21	gm
Total	72	

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	13:37	905.5	1.30	1.44	195	318	89	243	65	7
2		907.3	1.30	1.44	196	319	89	256	64	7
3		909.1	1.35	1.49	197	319	90	265	62	7
4		910.9	1.40	1.55	197	319	91	276	62	7
5		912.6	1.35	1.49	189	318	90	278	62	7
6	13:52	914.3	1.25	1.38	184	318	90	277	63	6
1	13:54	916.1	1.35	1.49	190	319	88	277	63	7
2		917.9	1.35	1.49	189	319	89	273	63	7
3		919.6	1.35	1.49	191	319	89	275	63	7
4		921.4	1.35	1.49	205	319	89	276	63	7
5		923.1	1.35	1.49	210	318	89	276	63	7
6	14:09	924.8	1.15	1.27	209	317	88	275	63	6

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	14:10	926.5	1.30	1.44	209	317	88	279	65	7
2		928.3	1.30	1.44	204	318	89	274	64	7
3		930.0	1.30	1.44	197	318	89	277	64	7
4		931.8	1.30	1.44	206	319	89	272	64	7
5		933.5	1.35	1.49	212	319	91	276	64	7
6	14:25	935.2	1.15	1.27	203	318	91	272	64	6
1	14:27	936.9	1.25	1.38	195	317	89	273	65	6
2		938.7	1.30	1.44	190	318	90	274	65	7
3		940.5	1.35	1.49	188	319	90	275	65	7
4		942.2	1.35	1.49	193	318	91	275	65	7
5		944.0	1.35	1.49	186	318	91	276	66	7
6	14:42	945.635	1.15	1.27	191	317	92	275	66	6

Sulfuric Acid Mist Field Data Form

Plant	Polk Power Station	Nozzle I.D. No.	#47	Dry Gas Meter Volume	
Location	Unit #1	Nozzle Diameter	0.201	Final	997.519 Ft³
Date	2-15-00	Pitot Tube No.	00122	Initial	955.346 Ft³
Method No.	8	Pitot Tube (C_p)	0.84	Net	~~42.163~~ 42.173 Ft³
Run No.	Blend 1 Run 9	Probe Length	14.0 FT		
Box Operator	RAB	Probe Liner Material	Pyrex	Equipment Leak Checks	
Probe Operator	BB / CD	Probe Heater Setting	250 °F	Initial	0.000 CFM @ 15 "Hg
Time - Start	15:20 End: 16:27	Pressure	Pb ("Hg): 29.95 Pg ("H2O): -.83 Ps ("Hg): 29.89	Final	0.000 CFM @ "H20
Sampling Time	60	Ambient Temperature	85 °F	Pitot Tube	OK @ 7.2 "H20
Min.\Pt.	2.5	Assumed Moisture (%)	6.0		
Meter Box No.	6	Filter Holder No.		Moisture Determination	
Stack Area Ft³	283.529	Comments	Blend 1 Run 9 Petcoke	Impinger	38 ml
Meter Cal. (ΔH)	1.780		Clear, warm	Silica Gel	18.2 gm
Meter Cal. (ΔY)	0.989			Total	56.2

Traverse Point No.	Clock Time	Gas Sample Volume (Ft³)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:20	957.1	1.30	1.44	199	318	92	256	63	7
2		958.9	1.30	1.44	193	319	94	264	62	7
3		960.7	1.30	1.44	199	319	96	269	59	7
4		962.4	1.30	1.44	208	319	97	272	59	7
5		964.2	1.30	1.44	211	319	98	273	60	7
6	15:35	965.9	1.20	1.33	219	318	99	273	61	6
1	15:38	967.7	1.30	1.44	210	318	97	271	~~66~~ 63	7
2		969.4	1.25	1.38	217	318	98	272	61	6
3		971.1	1.30	1.44	222	319	99	273	61	7
4		972.9	1.30	1.44	218	318	99	276	62	7
5		974.7	1.30	1.44	219	318	100	273	62	7
6	15:53	976.3	1.15	1.27	225	318	100	273	63	6

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	Δ P (In. H_2O)	Δ H (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Meter Temp. (°F)	Umbilical Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg)
1	15:55	978.1	1.30	1.44	207	317	98	276	65	7
2		979.9	1.35	1.49	203	318	98	276	64	7
3		981.6	1.35	1.49	203	318	99	275	64	7
4		983.4	1.30	1.44	198	319	99	275	64	7
5		985.2	1.30	1.44	200	319	99	275	64	7
6	16:10	987.0	1.30	1.44	201	318	98	276	63	7
1	16:12	988.7	1.30	1.44	212	316	98	273	64	7
2		990.5	1.35	1.49	221	318	99	275	63	7
3		992.3	1.35	1.49	216	318	99	274	63	7
4		994.1	1.35	1.49	220	318	100	275	63	7
5		996.0	1.30	1.44	226	318	101	275	64	7
6	16:27	997.519	1.15	1.27	225	318	101	275	65	6

F-4 FUEL BLEND ORSAT DATA SHEETS

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Polk Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
Blend 1 Run 1	2-14-00 [illegible]	CO2	8.0	8.0	8.0	8.0	
		O2	12.0	12.0	17.0	12.0	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
Blend 1 Run 2	2-14-00 [illegible]	CO2	8.0	8.0	8.0	8.0	
		O2	12.0	12.0	12.0	12.0	
		CO	~~80~~ 0	0	0	0	
		N2	80.0	80.0	80.0	80.0	
Blend 1 Run 3	2-14-00 [illegible]	CO2	8.2	8.2	8.2	8.2	
		O2	11.8	11.8	11.8	11.8	
		CO	0	0	0	0	
		N2	80.0	80.0	80.0	80.0	

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Polk Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume) 1	2	3	Avg.	Remarks
Blend 1 Run 4	2-14-00 APD	CO_2	8.0	8.0	8.0	8.0	
		O_2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N_2	80.0	80.0	80.0	80.0	
		CO_2					
		O_2					
		CO					
		N_2					
		CO_2					
		O_2					
		CO					
		N_2					

ORSAT DATA AND CALCULATION SHEET

Source Unit # 1 Location Polk Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
Blend 1 Run 5	2-15-00 RAD	CO2	8.5	8.5	8.5	8.5	
		O2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N2	79.5	79.5	79.5	79.5	
Blend 1 Run 6	2-15-00 RAD	CO2	8.5	8.5	8.5	8.5	
		O2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N2	79.5	79.5	79.5	79.5	
Blend 1 Run 7	2-15-00 RAB	CO2	8.0	8.0	8.0	8.0	
		O2	12.2	12.2	12.2	12.2	
		CO	0	0	0	0	
		N2	79.8	79.8	79.8	79.8	

ORSAT DATA AND CALCULATION SHEET

Source Unit #1 Location Polk Power Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
Blend 1 Run 8	2-15-00	CO_2	8.0	8.0	8.0	8.0	
		O_2	12.0	12.0	12.0	12.0	
		CO	0	0	0	0	
		N_2	80.0	80.0	80.0	80.0	
Blend 1 Run 9	2-15-00	CO_2	8.0	8.0	8.0	8.0	
		O_2	12.2	12.2	12.2	12.2	
		CO	0	0	0	0	
		N_2	79.8	79.8	79.8	79.8	
		CO_2					
		O_2					
		CO					
		N_2					

APPENDIX G

SAMPLE EQUIPMENT CALIBRATIONS

G-1 BASELINE EQUIPMENT CALIBRATIONS

G-2 FUEL BLEND EQUIPMENT CALIBRATIONS

G-1 BASELINE EQUIPMENT CALIBRATIONS

INITIAL DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.00 IN. HG.

DATE 06-Oct-99 PERFORMED BY Sink

SYSTEM LEAK CK. 0.000@ 27 "Hg ORIFICE LEAK CK. OK@ 6.3 "H2O

	RUN 1	RUN 2	RUN 3	RUN 4
VACUUM ("Hg)	3.0	3.0	3.0	3.0
dHw ("H2O)	0.5	1.1	1.6	2.0
dHd ("H2O)	0.5	1.0	1.5	2.0
INITIAL WTM	0.000	0.000	0.000	0.000
FINAL WTM	5.9595	8.9333	6.7078	7.6529
INITIAL DGM	674.148	680.514	690.009	697.452
FINAL DGM	680.241	689.775	697.048	705.582
TEMP. WTM (F)	71.0	71.0	71.0	71.0
TEMP. DGM (F)	87.0	89.0	90.0	91.0
TEST TIME (MIN.)	15.0	16.0	10.0	10.0

NET VOLUME WTM	5.9595	8.9333	6.7078	7.6529
NET VOLUME DGM	6.093	9.261	7.039	8.130
Y	1.006	0.995	0.983	0.972
dH@	1.725	1.741	1.806	1.847

AVERAGE Y = 0.989

ACCEPTABLE Y RANGE = 0.969 TO 1.009

AVERAGE dH@ = 1.780

ACCEPTABLE dH@ RANGE = 1.630 TO 1.930

Y = (Vw (Pb) x (Td + 460)) / (Vd (Pb + (dHd / 13.6)) x (Tw + 460)

dH@ = 0.0317 x dHd / (Pb (Td + 460)) x ((Tw + 460) x time) / Vw)^2

Reviewed By: RAm

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Date: 11/15/99

RECHECK OF ORIFICE AND DGM CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.10 IN. HG.

DATE 3-2-00 PERFORMED BY BDR

PRIOR Y = 0.989

SYSTEM LEAK CK. 0.000 @ 7" Hg

	RUN 1	RUN 2	RUN 3
VACUUM ("Hg)	7.0	7.0	7.0
dHw ("H2O)	1.05	1.05	1.05
dHd ("H2O)	1.00	1.00	1.00
INITIAL WTM	0.0000	8.3365	16.5600
FINAL WTM	8.3365	16.5600	24.7382
INITIAL DGM	302.780	311.688	320.485
FINAL DGM	311.688	320.485	329.246
TEMP. WTM (F)	70.5	70.5	70.0
TEMP. DGM (F)	88.0	89.0	90.0
TEST TIME (MIN.)	15.0	15.0	15.0

	RUN 1	RUN 2	RUN 3
NET VOLUME WTM	8.3365	8.2235	8.1782
NET VOLUME DGM	8.908	8.797	8.761
Y	0.964	0.965	0.966
dH@	1.751	1.796	1.809

PRIOR Y = 0.989
RECHECK Y = 0.965
% DIFFERENCE = -2.427

AVERAGE dH@ = 1.786

Y = (Vw (Pb) x (Td + 460)) / (Vd (Pb + (dHd / 13.6)) x(Tw + 460)
dH@ = 0.0317 x dHd / (Pb (Td + 460)) x ((Tw + 460) x time / Vw)^2

Reviewed By:

Date: 3/13/2000

SHARDATA\AIR SERVICES\CALS\PART\POSTTEST\BOX6\METCAL-H

NOZZLE CALIBRATION DATA FORM

NOZZLE SET NO. 1

DATE: 10/04/99 CALIBRATOR: Bruce D. Rodriguez BDR

NOZZLE I.D.	NOZZLE DIAMETER (IN.) D1	D2	D3	D diff.	D avg
#1	0.110	0.114	0.114	0.004	0.113
#4	0.122	0.122	0.122	0.000	0.112
#5	0.146	0.146	0.150	0.004	0.147
#6	0.197	0.197	0.193	0.004	0.196
#9	0.276	0.276	0.276	0.000	0.276
#10	0.293	0.293	0.293	0.000	0.293
#12	0.386	0.386	0.388	0.002	0.387
#15	0.159	0.159	0.159	0.000	0.159
#16	0.197	0.197	0.197	0.000	0.197
#19	0.278	0.278	0.280	0.002	0.279
#22	0.364	0.366	0.366	0.002	0.365
#30	0.309	0.311	0.311	0.002	0.310
#36	0.185	0.185	0.185	0.000	0.185
#37	0.211	0.211	0.211	0.000	0.211
#38	0.248	0.248	0.248	0.000	0.248
#46	0.189	0.189	0.189	0.000	0.189
#47	0.201	0.201	0.201	0.000	0.201
#48	0.250	0.252	0.250	0.002	0.251
#50	0.311	0.311	0.311	0.000	0.311
#58	0.240	0.240	0.240	0.000	0.240
#68	0.240	0.240	0.242	0.002	0.241

where:

D 1,2,3 = three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

D diff. = maximum difference between any two diameters, (in.) must be .004 in. or less.

D avg. = average of D1, D2, and D3.

REVIEWED BY: [signature]
DATE: 11/15/99

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FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO. 47

DATE: 3-3-00

CALIBRATED BY: BDR BDR

NOZZLE IDENTIFICATION	NOZZLE DIAMETER			¼D (IN.)	D AVG
	D1 (IN.)	D2 (IN.)	D3 (IN.)		
47	0.201	0.201	0.201	0.000 ERR	0.201 ERR
				ERR ERR	ERR ERR
				ERR ERR	ERR ERR

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

¼D= maximum difference between any two diameters,(in.). ¼D¥ 0.004 in.

D AVG= average of D1,D2 and D3.

Reviewed By: [signature]
Date: 3/13/2000

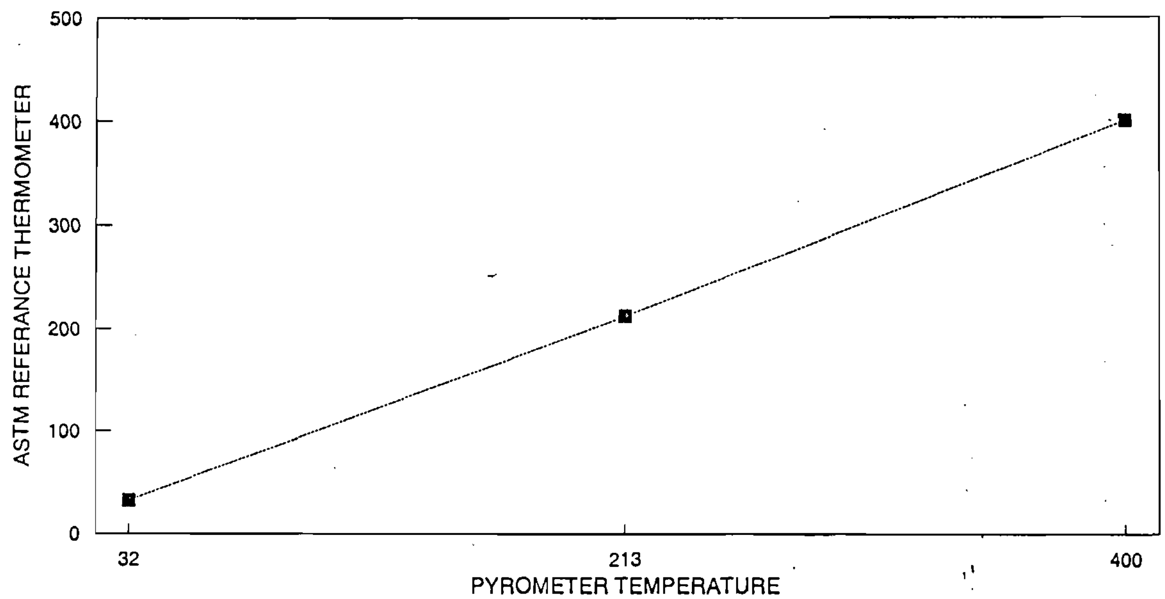
SHARDATA\AIR SERVICES\CALS\NOZZLES\POSTTEST\NOZCALF

PYROMETER CALIBRATION

PYROMETER NO.:	12	REFERENCE THERMOMETER:	ASTM 2-F
CTL SERIAL NO.:	12	SERIAL NO.:	L98-213
DATE:	10/19/99	CALIBRATOR:	CRAIG V. CORONADO

REFERENCE TEMP. (F)	PYROMETER INDICATION
32	32
212	213
400	400

PYROMETER TEMPERATURE CALIBRATION



REVIEWED BY: [signature] DATE: 11/15/99

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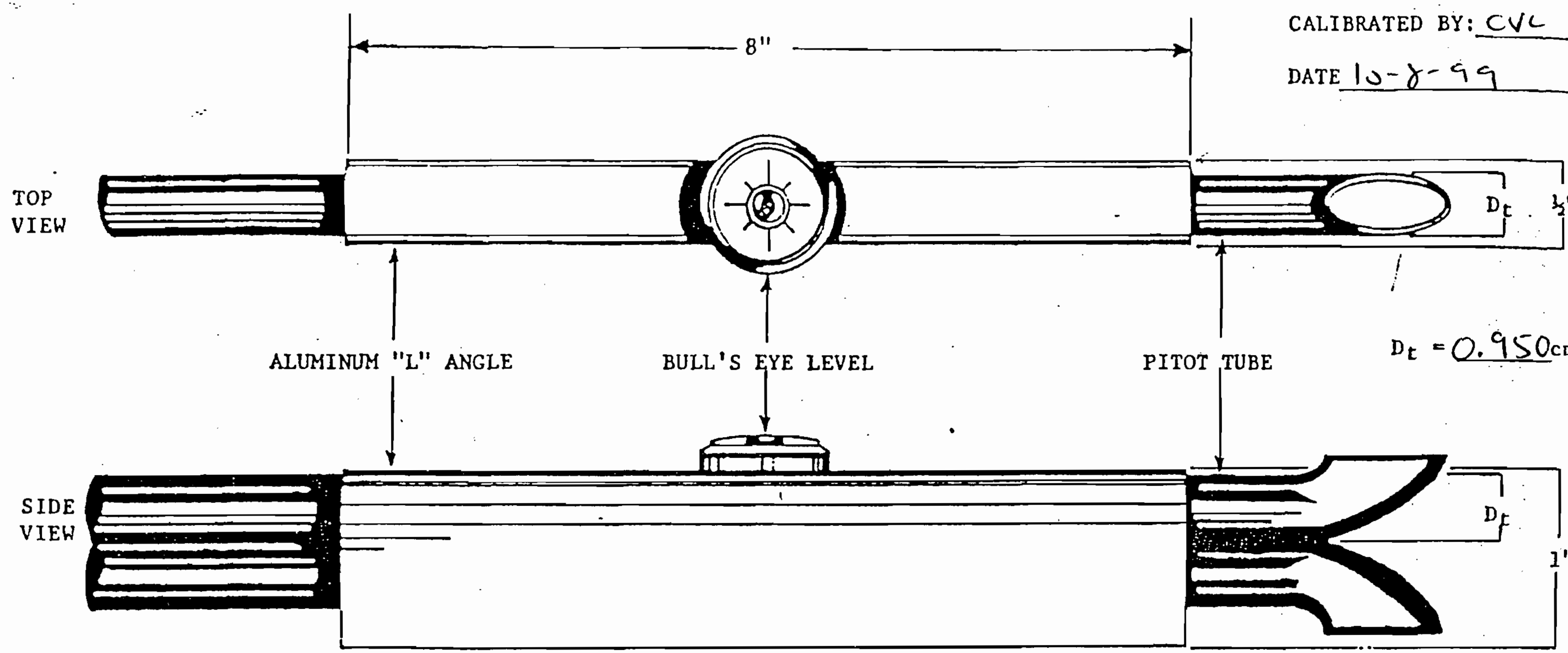
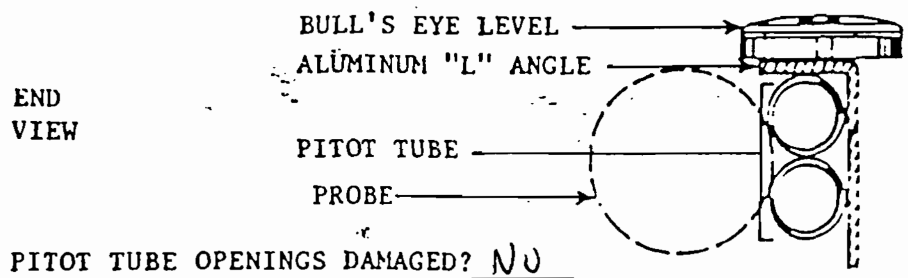
SERIAL NO. 2122

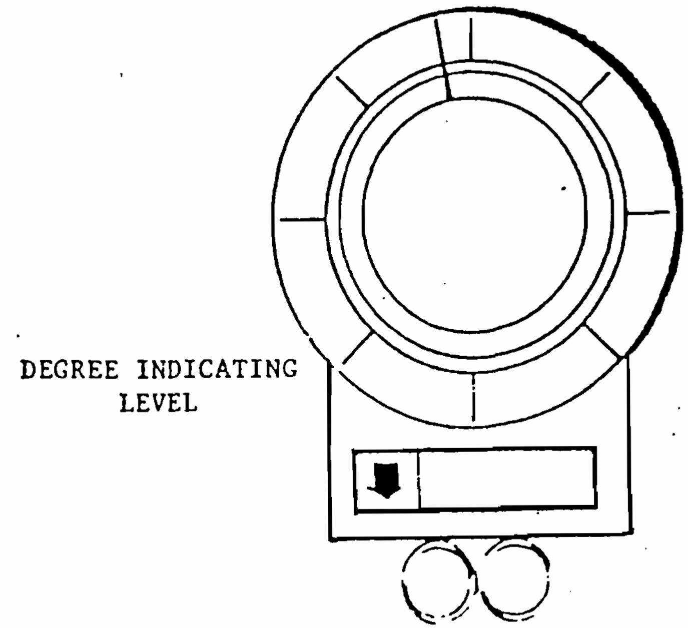
CALIBRATED BY: CVC

DATE 10-8-99



D_t = 0.950 cm.





PITOT TUBE OPENINGS DAMAGED? NO

COMMENTS: Removable Pitot

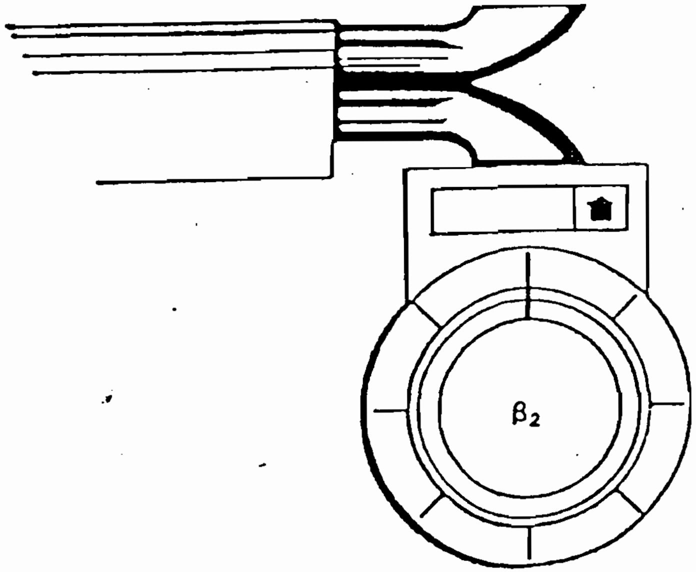
Reviewed By: RHM
Date: 11/15/99

PITOT TUBE CALIBRATION SET-UP POSITION

SERIAL NO. 00122

CALIBRATED BY CWL

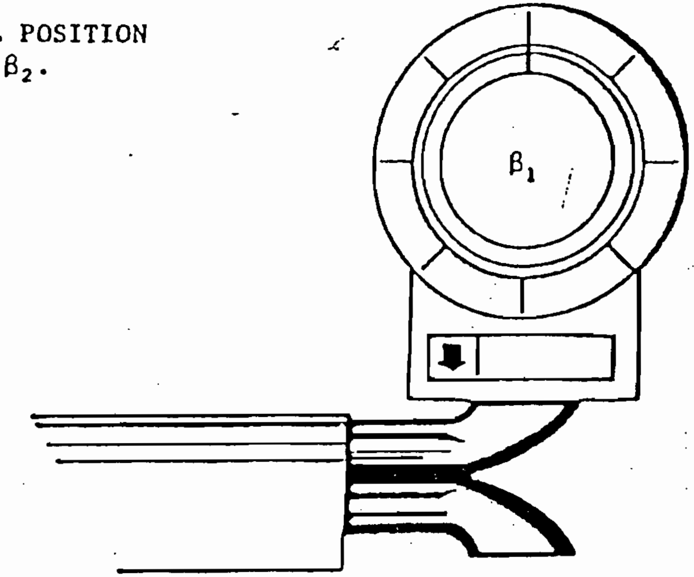
DATE 10-8-99

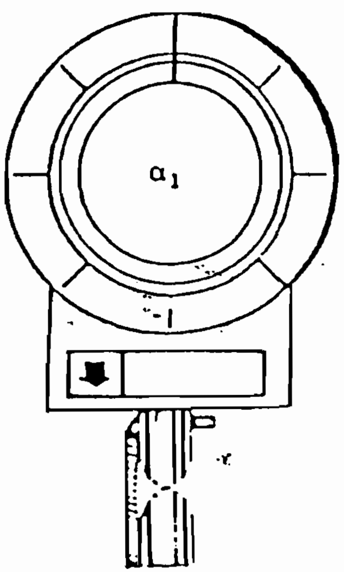


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 0.3 °(<5°) ✓

β_2 = 0.3 °(<5°) ✓

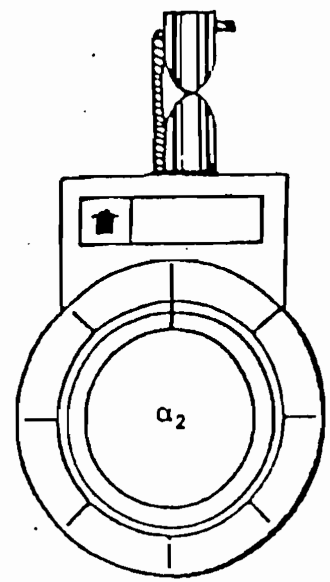




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 0.6 °(<10°) ✓

α_2 = 0.2 °(<10°) ✓



PITOT TUBE CALIBRATION; α and β DETERMINATION

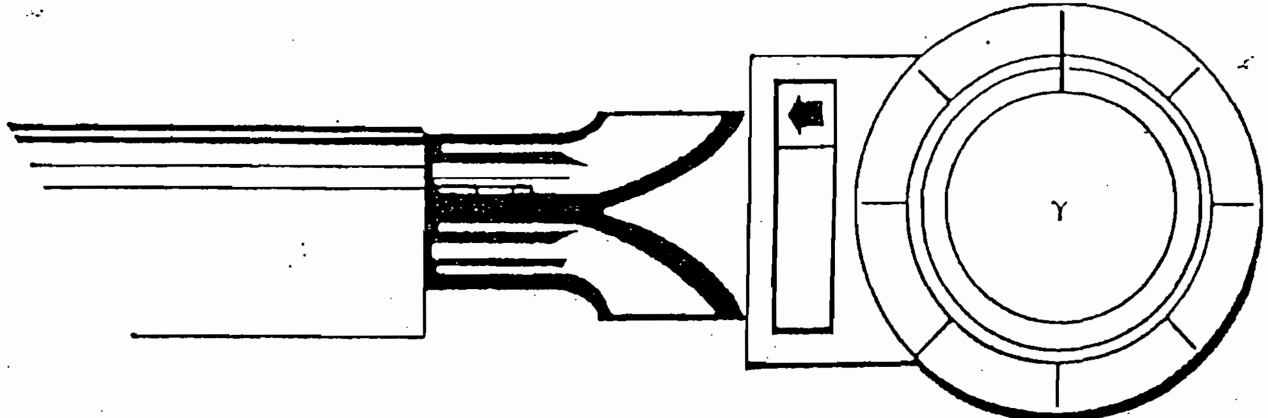
Reviewed By: BM

Date: 11/15/99

SERIAL NO. 00122

CALIBRATED BY CVC

DATE 10-8-99

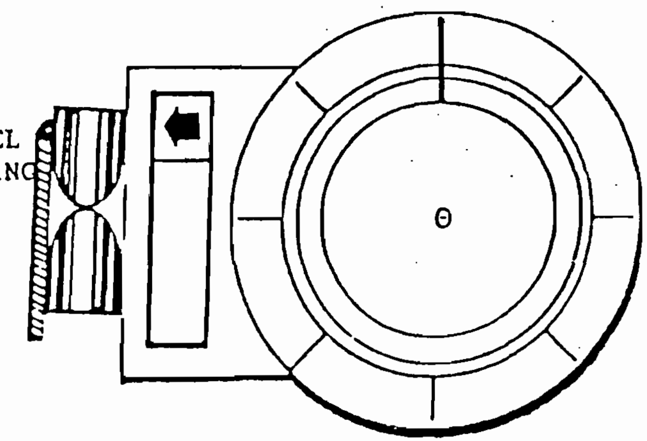


DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

$\gamma = $ 0.5 °

A = DISTANCE BETWEEN TIPS, ($P_a + P_b$), cm. = 2.340 .

$Z = A \sin \gamma =$ 0.020 ✓ cm; (<0.32 cm).



DEGREE INDICATING LEVEL
POSITION FOR DETERMINING
Θ, THEN CALCULATING W.

$\Theta = $ 0.4 °

$W = A \sin \Theta =$ 0.016 ✓ cm; (<0.08 cm).

PITOT TUBE CALIBRATION: A, W, γ, Θ and Z DETERMINATION

Reviewed By: [signature]
Date: 11/15/99

WET TEST METER CALIBRATION DATA FORM

DATE: 07/01/99

BAROMETRIC PRESS: 30.09

WET TEST METER SERIAL NUMBER: 12-AH-4

NAME: Suf

AMBIENT TEMP: 70.5

RUN NUMBER	VOLUME OF WATER DISPLACED (LITERS) Va	INITIAL METER READING (FT3)	FINAL METER READING (FT3)	NET METER VOLUME (FT3)	NET METER VOLUME (LITERS) Vw	ERROR
1	3.3600	0.0000	0.1184	0.1184	3.3531	-0.002053571
2	3.3600	0.1184	0.2372	0.1188	3.3644	0.001309524
3	3.3600	0.2372	0.3555	0.1183	3.3503	-0.002886905
4	3.3600	0.3555	0.4731	0.1176	3.3304	-0.008809524
					AVG. ERROR =	-0.003110119

CALIBRATIONS:

CORRECTION FACTOR : 1.003119822

(1.000 + / - 0.010)

ERROR = (Vw - Va) / Va

CORRECTION FACTOR (C.F.) = 1 / (1 + AVERAGE ERROR)

* CONVERSION FACTOR , FT3 TO LITERS = FT3 x 28.32

WHEN USING THE WET TEST METER, THE ACTUAL VOLUME OF AIR CAN BE DETERMINED BY THE EQUATION:

Va = Vw x C.F.

WHERE:

Va = ACTUAL VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

Vw = MEASURED VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

C.F. = CORRECTION FACTOR FOR THE WET TEST METER.

REVIEWED BY: [signature]

DATE: 8/10/99

REVISED 5-9-96

BAROMETER CALIBRATION DATA FORM

DATE: 1-4-00 CALIBRATOR: BDR

INST. NO: 227

COMMENTS:

TIME OF READING	BAROMETER READING (HG")	REFERENCE STANDARD READING (HG")	DIFFERENCE (HG")
1020	30.22	30.16	0.06
1215	30.15	30.14	0.01
1400	30.13	30.13	0.00
			0.00
			0.00
			0.00

*NOTE: BAROMETRIC READINGS MUST AGREE WITHIN 0.1 INCHES HG OF READINGS OBTAINED FROM THE REFERENCE STANDARD, THE NATIONAL WEATHER SERVICE, RUSKIN FL. TO BE DEEMED ACCEPTABLE.

REVIEWED BY: TGm

DATE: 2/21/00

SHARDATA\AIR SERVICES\CALS\BAROMETER\00224

REVISED 5-9-96

G-2 FUEL BLEND EQUIPMENT CALIBRATIONS

INITIAL DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.00 IN. HG.

DATE 06-Oct-99 PERFORMED BY Sumk

SYSTEM LEAK CK. 0.000@ 27 "Hg ORIFICE LEAK CK. OK@ 6.3 "H2O

	RUN 1	RUN 2	RUN 3	RUN 4
VACUUM ("Hg)	3.0	3.0	3.0	3.0
dHw ("H2O)	0.5	1.1	1.6	2.0
dHd ("H2O)	0.5	1.0	1.5	2.0
INITIAL WTM	0.000	0.000	0.000	0.000
FINAL WTM	5.9595	8.9333	6.7078	7.6529
INITIAL DGM	674.148	680.514	690.009	697.452
FINAL DGM	680.241	689.775	697.048	705.582
TEMP. WTM (F)	71.0	71.0	71.0	71.0
TEMP. DGM (F)	87.0	89.0	90.0	91.0
TEST TIME (MIN.)	15.0	16.0	10.0	10.0

NET VOLUME WTM	5.9595	8.9333	6.7078	7.6529
NET VOLUME DGM	6.093	9.261	7.039	8.130
Y	1.006	0.995	0.983	0.972
dH@	1.725	1.741	1.806	1.847

AVERAGE Y = 0.989

ACCEPTABLE Y RANGE = 0.969 TO 1.009

AVERAGE dH@ = 1.780

ACCEPTABLE dH@ RANGE = 1.630 TO 1.930

Y = (Vw (Pb) x (Td + 460)) / (Vd (Pb + (dHd / 13.6)) x (Tw + 460)

dH@ = 0.0317 x dHd / (Pb (Td + 460)) x ((Tw + 460) x time) / Vw)^2

Reviewed By: RAM

h:\shardata\source\cals\part\initial\box5\metcal-i

Date: 11/15/99

RECHECK OF ORIFICE AND DGM CALIBRATION

CONTROL BOX NO.	6	BAROMETRIC PRESS.	30.10	IN. HG.
DATE	3-2-00	PERFORMED BY	BDR	
		PRIOR Y =	0.989	

SYSTEM LEAK CK. 0.000 @ 7" Hg

	RUN 1	RUN 2	RUN 3
VACUUM ("Hg)	7.0	7.0	7.0
dHw ("H2O)	1.05	1.05	1.05
dHd ("H2O)	1.00	1.00	1.00
INITIAL WTM	0.0000	8.3365	16.5600
FINAL WTM	8.3365	16.5600	24.7382
INITIAL DGM	302.780	311.688	320.485
FINAL DGM	311.688	320.485	329.246
TEMP. WTM (F)	70.5	70.5	70.0
TEMP. DGM (F)	88.0	89.0	90.0
TEST TIME (MIN.)	15.0	15.0	15.0
NET VOLUME WTM	8.3365	8.2235	8.1782
NET VOLUME DGM	8.908	8.797	8.761
Y	0.964	0.965	0.966
dH@	1.751	1.796	1.809

PRIOR Y = 0.989
RECHECK Y = 0.965
% DIFFERENCE = -2.427

AVERAGE dH@ = 1.786

$Y = (Vw (Pb) \times (Td + 460)) / (Vd (Pb + (dHd / 13.6)) \times (Tw + 460)$
$dH@ = 0.0317 \times dHd / (Pb (Td + 460)) \times ((Tw + 460) \times time / Vw)^2$

Reviewed By: [signature]
Date: 3/13/2000

NOZZLE CALIBRATION DATA FORM

NOZZLE SET NO. 1

DATE: 10/04/99 CALIBRATOR: Bruce D. Rodriguez BDR

NOZZLE I.D.	NOZZLE DIAMETER (IN.) D1	D2	D3	D diff.	D avg
#1	0.110	0.114	0.114	0.004	0.113
#4	0.122	0.122	0.122	0.000	0.112
#5	0.146	0.146	0.150	0.004	0.147
#6	0.197	0.197	0.193	0.004	0.196
#9	0.276	0.276	0.276	0.000	0.276
#10	0.293	0.293	0.293	0.000	0.293
#12	0.386	0.386	0.388	0.002	0.387
#15	0.159	0.159	0.159	0.000	0.159
#16	0.197	0.197	0.197	0.000	0.197
#19	0.278	0.278	0.280	0.002	0.279
#22	0.364	0.366	0.366	0.002	0.365
#30	0.309	0.311	0.311	0.002	0.310
#36	0.185	0.185	0.185	0.000	0.185
#37	0.211	0.211	0.211	0.000	0.211
#38	0.248	0.248	0.248	0.000	0.248
#46	0.189	0.189	0.189	0.000	0.189
#47	0.201	0.201	0.201	0.000	0.201
#48	0.250	0.252	0.250	0.002	0.251
#50	0.311	0.311	0.311	0.000	0.311
#58	0.240	0.240	0.240	0.000	0.240
#68	0.240	0.240	0.242	0.002	0.241

where:

D 1,2,3 = three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

D diff. = maximum difference between any two diameters, (in.) must be .004 in. or less.

D avg. = average of D1, D2, and D3.

REVIEWED BY: KGM
DATE: 11/15/99

Page 1
OF 1

h:\shardata\air programs\cals\nozzles\initial\nozcali.wk4

FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO. 47

DATE: 3-3-00

CALIBRATED BY: BDR *BDR*

NOZZLE IDENTIFICATION	NOZZLE DIAMETER D1 (IN.)	D2 (IN.)	D3 (IN.)	ΔD (IN.)	D AVG
47	0.201	0.201	0.201	0.000 ERR	0.201 ERR
				ERR ERR	ERR ERR
				ERR ERR	ERR ERR

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

ΔD= maximum difference between any two diameters,(in.). ΔD¥ 0.004 in.

D AVG= average of D1,D2 and D3.

SHARDATA\AIR SERVICES\CALS\NOZZLES\POSTTEST\NOZCALF

Reviewed By: *[signature]*
Date: *3/13/2000*

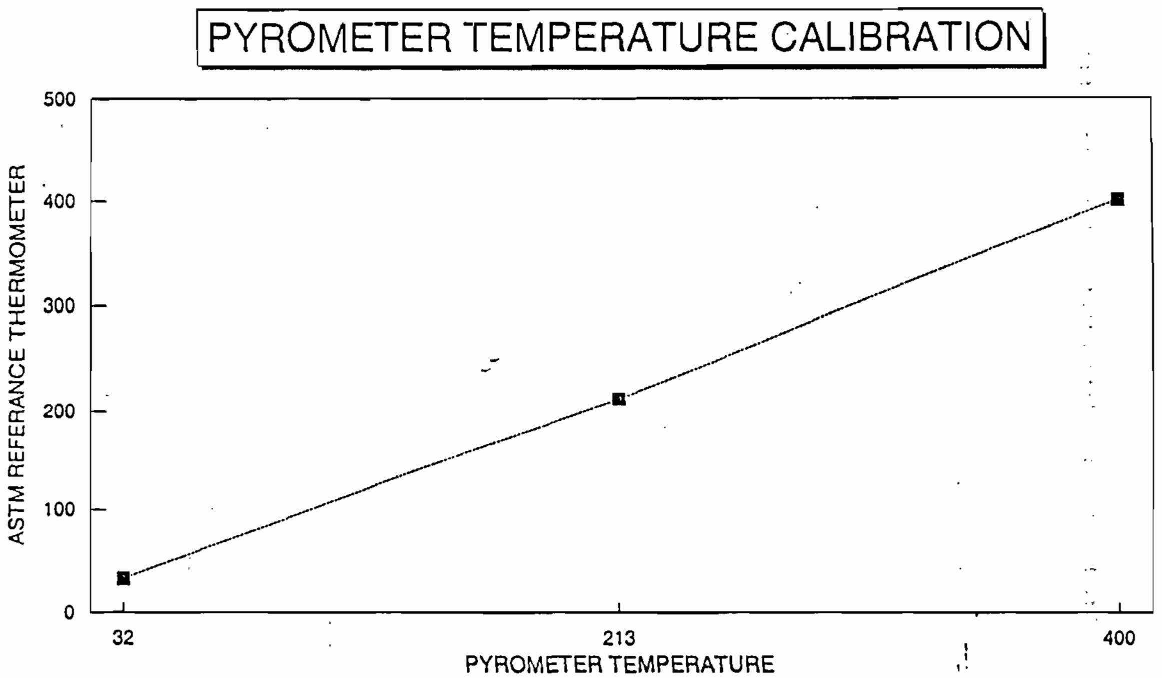
PYROMETER CALIBRATION

PYROMETER NO.: 12   REFERENCE THERMOMETER: ASTM 2-F

CTL SERIAL NO.: 12   SERIAL NO.: L98-213

DATE: 10/19/99   CALIBRATOR: CRAIG V. CORONADO

REFERENCE TEMP. (F)	PYROMETER INDICATION
32	32
212	213
400	400



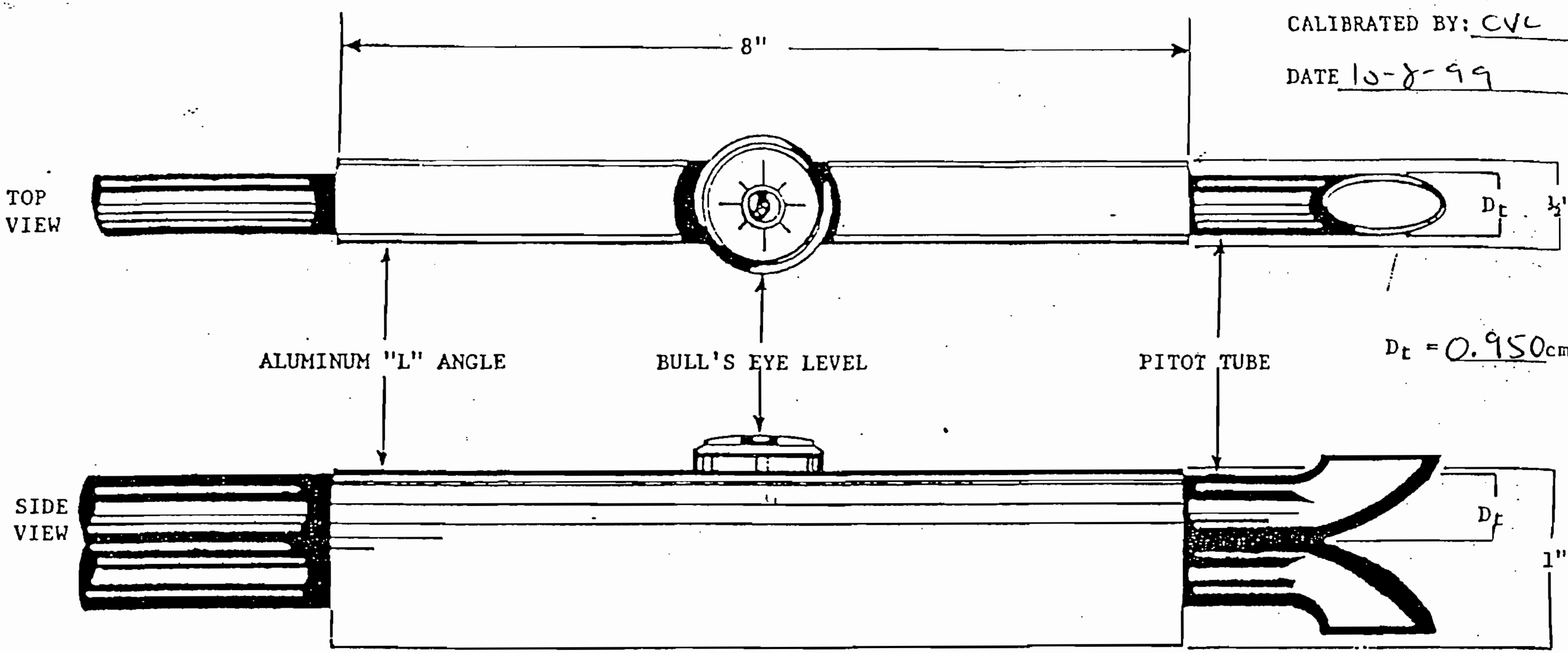
REVIEWED BY: [signature]   DATE: 11/15/99

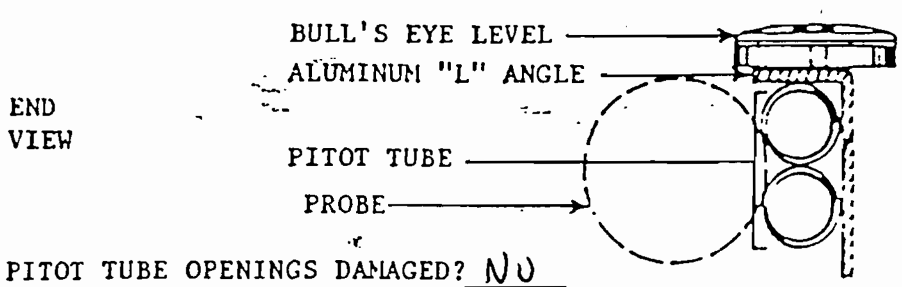
h:\shardata\air&wast\cals\pyros

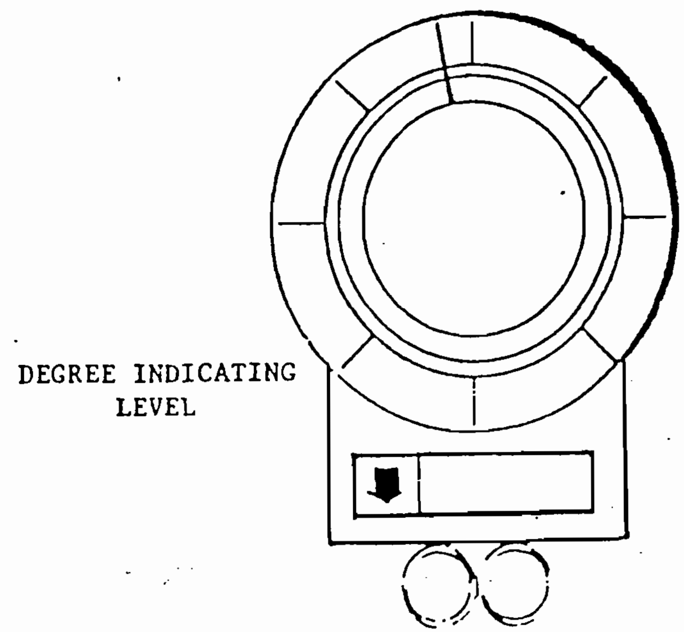
SERIAL NO. 2122

CALIBRATED BY: CVC

DATE 10-8-99







PITOT TUBE OPENINGS DAMAGED? NO

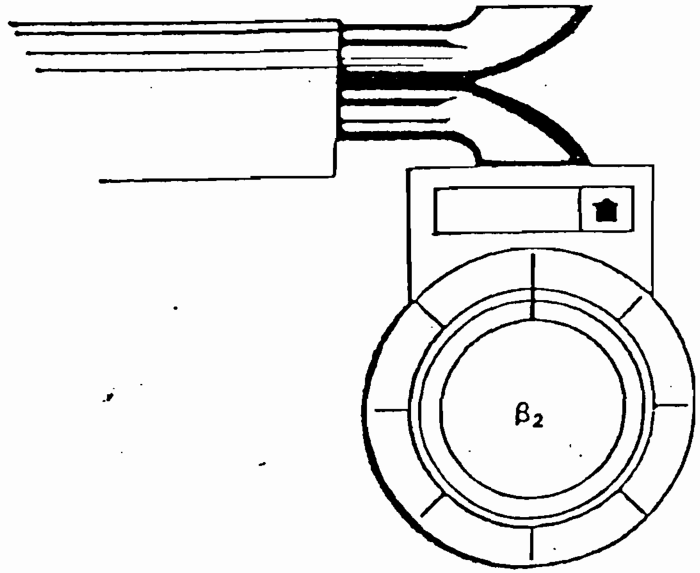
COMMENTS: Removable Pitot

Reviewed By: RHM
Date: 11/15/99

SERIAL NO. 001ad

CALIBRATED BY CWL

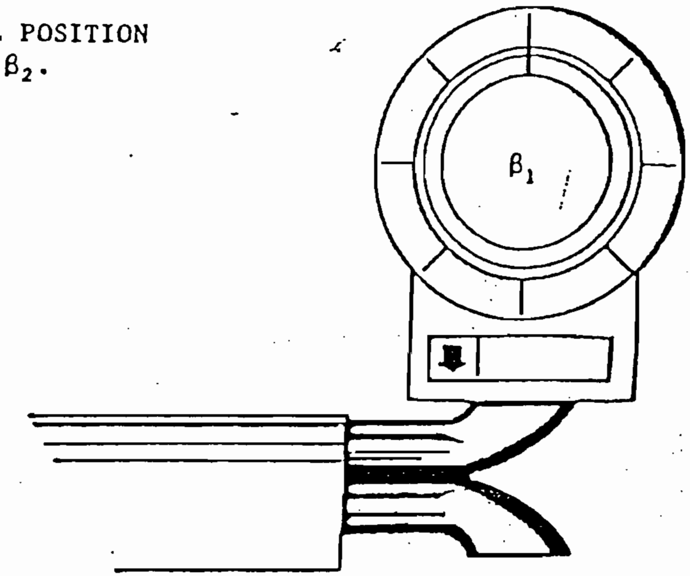
DATE 10-8-99

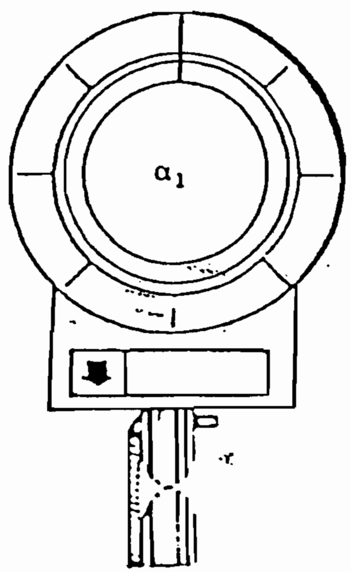


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 0.3 °(<5°) ✓

β_2 = 0.3 °(<5°) ✓

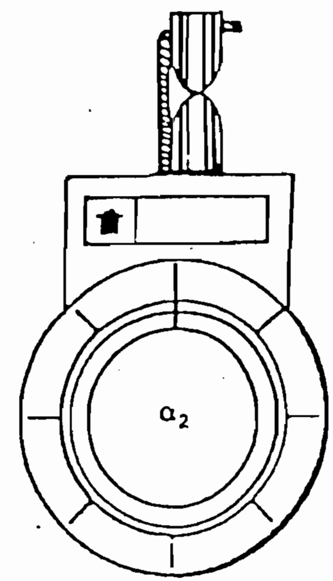




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 0.6 °(<10°) ✓

α_2 = 0.2 °(<10°) ✓



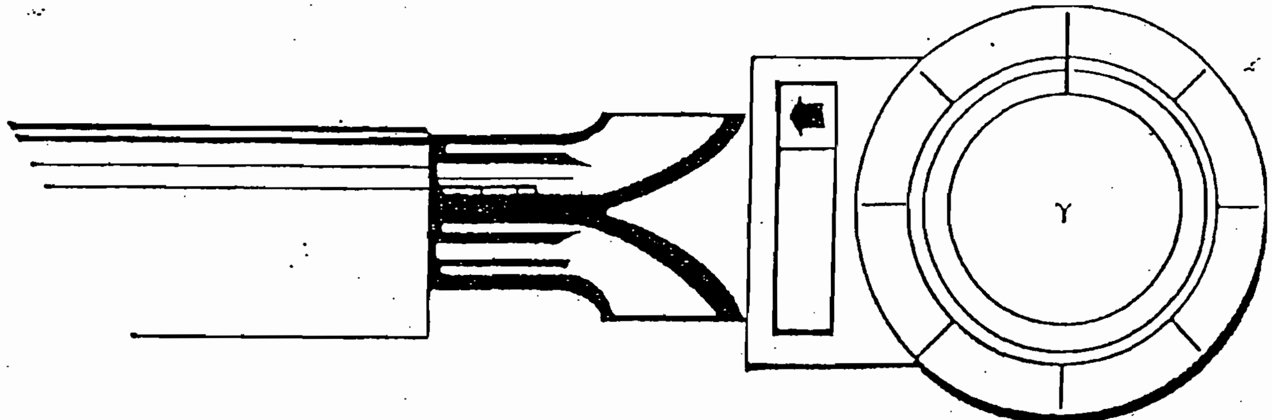
PITOT TUBE CALIBRATION; α and β DETERMINATION

Reviewed By: [signature]
Date: 11/15/99

SERIAL NO. 00122

CALIBRATED BY CVC

DATE 10-8-99

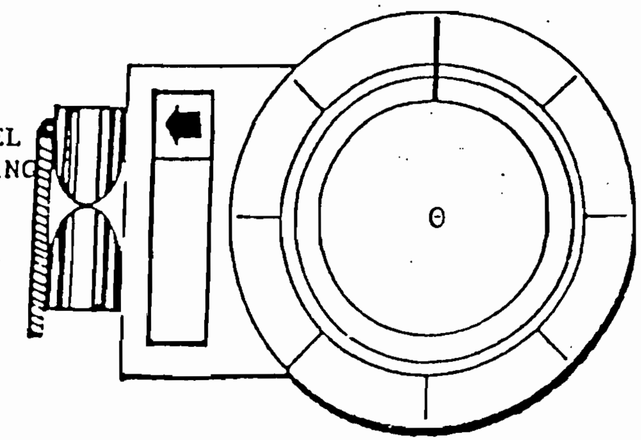


γ = 0.5 °

DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

A = DISTANCE BETWEEN TIPS, $(P_a + P_b)$, cm. = 2.340 .

$Z = A \sin \gamma$ = 0.020 ✓ cm; (<0.32 cm).



DEGREE INDICATING LEVEL
POSITION FOR DETERMINING
Θ, THEN CALCULATING W.

Θ = 0.4 °

$W = A \sin \Theta$ = 0.016 ✓ cm; (<0.08 cm).

PITOT TUBE CALIBRATION: A, W, γ, Θ and Z DETERMINATION

Reviewed By: [signature]
Date: 11/15/99

WET TEST METER CALIBRATION DATA FORM

DATE: 07/01/99

BAROMETRIC PRESS: 30.09

WET TEST METER SERIAL NUMBER: 12-AH-4

NAME: Sfr

AMBIENT TEMP: 70.5

RUN NUMBER	VOLUME OF WATER DISPLACED (LITERS) Va	INITIAL METER READING (FT3)	FINAL METER READING (FT3)	NET METER VOLUME (FT3)	NET METER VOLUME (LITERS) Vw	ERROR
1	3.3600	0.0000	0.1184	0.1184	3.3531	-0.002053571
2	3.3600	0.1184	0.2372	0.1188	3.3644	0.001309524
3	3.3600	0.2372	0.3555	0.1183	3.3503	-0.002886905
4	3.3600	0.3555	0.4731	0.1176	3.3304	-0.008809524
					AVG. ERROR =	-0.003110119

CALCULATIONS:

CORRECTION FACTOR : 1.003119822

(1.000 + / - 0.010)

ERROR = (Vw - Va) / Va

CORRECTION FACTOR (C.F.) = 1 / (1 + AVERAGE ERROR)

* CONVERSION FACTOR , FT3 TO LITERS = FT3 x 28.32

WHEN USING THE WET TEST METER, THE ACTUAL VOLUME OF AIR CAN BE DETERMINED BY THE EQUATION:

Va = Vw x C.F.

WHERE:

Va = ACTUAL VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

Vw = MEASURED VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

C.F. = CORRECTION FACTOR FOR THE WET TEST METER.

REVIEWED BY: [signature]

DATE: 8/6/99

REVISED 5-9-96

BAROMETER CALIBRATION DATA FORM

DATE: 1-4-00 CALIBRATOR: BDR

INST. NO: 227

COMMENTS:

TIME OF READING	BAROMETER READING (HG")	REFERENCE STANDARD READING (HG")	DIFFERENCE (HG")
1020	30.22	30.16	0.06
1215	30.15	30.14	0.01
1400	30.13	30.13	0.00
			0.00
			0.00
			0.00

*NOTE: BAROMETRIC READINGS MUST AGREE WITHIN 0.1 INCHES HG OF READINGS OBTAINED FROM THE REFERENCE STANDARD, THE NATIONAL WEATHER SERVICE, RUSKIN FL. TO BE DEEMED ACCEPTABLE.

REVIEWED BY: [signature]
DATE: 2/21/00

SHARDATA\AIR SERVICES\CALS\BAROMETER\00224

REVISED 5-9-96

APPENDIX H

CHAIN OF CUSTODY

H-1 BASELINE CHAIN OF CUSTODY

H-2 FUEL BLEND CHAIN OF CUSTODY

SAMPLE RECOVERY AND INTEGRITY DATA

Plant Polk Power Station Sample location Unit #1

Field Data Checks

Sample recovery personnel R.A. Barthelette

Person with direct responsibility for recovered samples Same As Above

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Base-1 Isopropanol	1-7-00 @ 11:56	✓	✓
2	Base-2 "	1-7-00 @ 15:17	✓	✓
3	Base-3 "	1-7-00 @ 17:13	✓	✓
4	Base-4 "	1-7-00 @ 19:10	✓	✓
5				
6				
Blank				

Remarks

Signature of field sample trustee [signature]

Laboratory Data Checks

Lab person with direct responsibility for recovered samples [signature]

Date recovered samples received 2·8·00 @ 0700

Analyst [signature]

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Base 1 - Isopropanol	2·8·00 @ 0700	✓	✓
2	Base 2 - "	2·8·00 @ 0700	✓	✓
3	Base 3 - "	2·8·00 @ 0700	✓	✓
4	Base 4 - "	2·8·00 @ 0700	✓	✓
5				
6				
Blank				

SAMPLE RECOVERY AND INTEGRITY DATA

Plant Polk Power Station Sample location Unit #1

Field Data Checks

Sample recovery personnel Bob Barthelette / Byron Burrows / Chuck Defeney

Person with direct responsibility for recovered samples Bob Barthelette

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Blend 1 Run 5 IPA	2-15-00 @ 10:20	✓	✓
2	Blend 1 Run 6 IPA	2-15-00 @ 11:55	✓	✓
3	Blend 1 Run 7 IPA	2-15-00 @ 13:30	✓	✓
4	Blend 1 Run 8 IPA	2-15-00 @ 15:10	✓	✓
5	Blend 1 Run ~~8~~ 9 IPA	2-15-00 @ 16:49	✓	✓
6				
Blank				

Remarks

Signature of field sample trustee [signature]

Laboratory Data Checks

Lab person with direct responsibility for recovered samples [signature]

Date recovered samples received 2·16·00 @ 7:00

Analyst [signature]

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	Blend 1 Run 5 IPA	2·16·00 @ 7:00	✓	✓
2	Blend 1 Run 6 IPA	2·16·00 @ 7:00	✓	✓
3	Blend 1 Run 7 IPA	2·16·00 @ 7:00	✓	✓
4	Blend 1 Run 8 IPA	2·16·00 @ 7:00	✓	✓
5	Blend 1 Run 9 IPA	2·16·00 @ 7:00	✓	✓
6				
Blank				

Remarks AA 53659

Signature of lab sample trustee [signature]

APPENDIX I

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

Corporate Environmental Services

Robert Barthelette Jr.	Environmental Technician
Craig Coronado	Associate Technician
Raymond McDarby	Senior Environmental Technician
Glenn Naslund	Environmental Technician
Bruce Rodriguez	Technician
David Smith	Senior Environmental Technician

Environmental Planning

Linda Kong	Engineer Associate

Polk Power Station

David Knapp	Environmental And Safety Engineer
John McDaniel	Senior Engineer

TECO
TAMPA ELECTRIC

RECEIVED
MAR 31 2000
BUREAU OF AIR REGULATION

March 30, 2000

Mr. Syed Arif
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7910 6491 1496

Mr. Bill Proses
Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via FedEx
Airbill No. 7910 6491 1761

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petroleum Coke Test Burn
Permit No. 1050233-002-AC, PSD-FL-194
Notification of Postponement

Dear Mr. Arif and Mr. Proses:

TEC was scheduled to perform the second portion of the petroleum coke blend emissions test at Polk Power Station on April 4 - 5, 2000. However, there is a schedule conflict due to maintenance work on Unit 1. Therefore, the test has been postponed until further notice. Should you have any questions, please feel free to contact me at (813) 641-5034.

Sincerely,

Linda M. Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK124

c: Mr. Howard Rhodes - FDEP
Mr. Buck Oven - FDEP
Mr. Bill Thomas - FDEP SWD
Mr. Gerald Kissel - FDEP SWD

TAMPA ELECTRIC

March 29, 2000

Mr. Howard Rhodes
Division Director
Florida Department of Environmental Protection
Air Resources Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Via FedEx
Airbill No. 7910 6445 6226

Mr. Buck Oven, P.E.
Administrator
Florida Department of Environmental Protection
Siting Coordination Office
Twin Towers Office Building
2600 Blair Stone Road MS 48
Tallahassee, FL 32399-2400

Via FedEx
Airbill No. 7918 2246 0474

Mr. Bill Thomas, P.E.
District Air Program Administrator
Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via FedEx
Airbill No. 7923 1767 1312

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petcoke Test Burn Submittal of the Emissions Test Report

PSD-FL-194

Gentlemen:

Tampa Electric Company has completed the first in a series of Petcoke blend emissions tests on February 15, 2000. Accordingly, the Emissions Test Report is enclosed for your review.

Should you have any questions or concerns regarding the enclosed Emissions Test Report, please contact Linda Kong or me at (813) 641-5034.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Director
Environmental Planning

EP\gm\LMK123

c: Mr. Syed Arif, FDEP (enc)
Via FedEx – Airbill No. 7908 2573 4982

Mr. Gerald Kissel, FDEP SWD (enc)
Via FedEx – Airbill No. 7910 6446 2276

Mr. Bill Proses, FDEP SWD

TECO
TAMPA ELECTRIC

March 23, 2000

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Certified Mail No. Z 504 094 731
Return Receipt Requested

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine Fourth Test Courtesy Notification

Dear Mr. Fancy:

With respect to the Polk Power Station NO_x BACT Determination testing, this letter serves to notify the Department that the next scheduled NO_x BACT test on the combustion turbine is scheduled to take place on April 12, 2000. This is subject to change based on operating conditions, equipment availability, and manpower availability. If you have any questions, please feel free to contact me at (813) 641-5125.

Sincerely,

Shannon K. Todd
Engineer
Environmental Planning

EP\gm\SKT153

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Steve Pak - EPCHC

Scott 2/28
AL

TAMPA ELECTRIC

RECEIVED

MAR 20 2000

BUREAU OF AIR REGULATION

March 15, 2000

Mr. Richard Kirby, P.E.
Chief of Permitting
Hillsborough County Environmental Protection Commission
1410 North 21st Street
Tampa, Florida 33605

Via FedEx
Airbill No. 7908 2094 2609

Re: Tampa Electric Company Rental of Additional Generation to Meet Summer Load Courtesy Notification

PSD-FL-194C

Dear Mr. Kirby:

As you are aware, there will be a critical power shortage in the State of Florida this summer. To address this, Tampa Electric Company has taken several steps to increase system capacity including the acceleration of the Polk Unit 2 project and the installation of an inlet air fogging system on Big Bend CTs 2 and 3. While this additional generating capacity helps the situation, Tampa Electric projections for the summer load still show that our system capacity may fall short of demand. Therefore, to address this, TEC plans to rent and place ten (10) 2 MW diesel fired engine generators at various substations throughout the area. TEC will limit fuel consumption at each facility to no more than 32,000 gallons per year in accordance with the categorical permit exemption under 62-210.300(3)(a)21 F.A.C. This is a temporary project and the units are expected to be removed from the substations by August 2000.

If you have any questions, please feel free to telephone me at (813) 641-5125.

Sincerely,

Shannon K. Todd
Engineer
Environmental Planning

EP\gm\SKT149

c: Mr. Clair Fancy, FDEP
Mr. Jerry Kissel, FDEP SW

TECO
TAMPA ELECTRIC

RECEIVED
MAR 15 2000
BUREAU OF AIR REGULATION

RECEIVED
MAR 15 2000
DIVISION OF AIR
RESOURCES MANAGEMENT

March 14, 2000

Mr. Howard L. Rhodes
Director-Bureau of Air Regulations
Florida Department of Environmental Protection
Air Resources Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Via Fed Ex
Airbill No. 7915 6119 5421

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petroleum Coke Test Burn
Permit No. 1050233-002-AC, PSD-FL-194

Dear Mr. Rhodes:

Please be informed that Tampa Electric Company (TEC) proposes to begin the second portion of the petroleum coke/coal fuel blend test burn on Polk Power Station Unit 1 on March 29, 2000. Emissions performance tests are scheduled for April 4 - 5, 2000. TEC will notify the Department accordingly if there are any changes to the schedule.

If you have any questions, please contact Linda Kong at (813) 641-5034 or me at (813) 641-5016.

Sincerely,

for

Gregory M. Nelson, P.E. LMK
Manager
Environmental Planning

EP\gm\LMK121

c: Mr. Syed Arif – FDEP
Mr. Buck Oven - FDEP
Mr. Bill Thomas – FDEP SWD

TECO
TAMPA ELECTRIC

RECEIVED
MAR 20 2000
BUREAU OF AIR REGULATION

March 14, 2000

Mr. Howard L. Rhodes
Director-Bureau of Air Regulations
Florida Department of Environmental Protection
Air Resources Management
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Via Fed Ex
Airbill No. 7915 6119 5421

Re: Tampa Electric Company (TEC) – Polk Power Station Unit 1
Petroleum Coke Test Burn
Permit No. 1050233-002-AC, PSD-FL-194

Dear Mr. Rhodes:

Please be informed that Tampa Electric Company (TEC) proposes to begin the second portion of the petroleum coke/coal fuel blend test burn on Polk Power Station Unit 1 on March 29, 2000. Emissions performance tests are scheduled for April 4 - 5, 2000. TEC will notify the Department accordingly if there are any changes to the schedule.

If you have any questions, please contact Linda Kong at (813) 641-5034 or me at (813) 641-5016.

Sincerely,

for

Gregory M. Nelson, P.E. LMK
Manager
Environmental Planning

EP\gm\LMK121

c: Mr. Syed Arif – FDEP
Mr. Buck Oven - FDEP
Mr. Bill Thomas – FDEP SWD

TECO

TAMPA ELECTRIC

RECEIVED
MAR 15 2000
BUREAU OF AIR REGULATION

March 14, 2000

Mr. Syed Arif
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 7908 2060 9690

Re: Tampa Electric Company (TEC) Polk Power Station Unit One
Request for Petroleum Coke Testing Protocol Modification
Permit No. 1050233-002-AC, PSD-FL-194C, Condition 2

Dear Mr. Arif:

In response to your telephone conversation with Linda Kong on March 10, 2000, TEC hereby submits a request to modify the above referenced testing protocol. TEC proposes to proceed directly with a petcoke/coal blend syngas performance test at a 60-70 percent petcoke blend. We feel confident that we can operate at this interval. Depending on the outcome of this proposed test burn, we might wish to conduct our third blend test at a lower petcoke blend percentage.

As a result of the initial blend test with 40 percent petcoke, the current testing protocol has been found by TEC to be an unnecessary use of valuable resources. The suggested modification will save time and manpower associated with numerous stack test requirements without compromising the overall effectiveness of the petcoke test burn study. As stated in Condition 2, TEC will continue to terminate petcoke blend test at a maximum petcoke blend level of 70 percent. TEC would like to begin the second petcoke study at the 60-70 percent petcoke blend on March 29, 2000 and would appreciate the Department granting us authorization.

TEC hopes that this information is sufficient concerning the petcoke test burn protocol modification request; however, feel free to contact Linda Kong or me at (813) 641-5016 for any questions or concerns.

Sincerely,

for

Gregory M. Nelson, P.E. LMK
Manager
Environmental Planning

EP\gm\LMK120

c: Mr. Buck Oven, FDEP
Mr. Bill Thomas, FDEP, SWD

TECO

TAMPA ELECTRIC

AL

RECEIVED

MAR 08 2000

BUREAU OF AIR REGULATION

March 7, 2000

Mr. Clair Fancy
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via Fed Ex
Airbill No. 7918 2049 1172

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine – Test #3

Dear Mr. Fancy:

As per Specific Condition A.49 of the Polk Power Station Title V Permit, Tampa Electric has completed the third NO_x BACT Determination Test on the combustion turbine while operating on syngas. Accordingly, the final report is attached for your review. If you have any questions, please feel free to contact Shannon Todd or me at (813) 641-5125.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Manager
Environmental Planning

EP\gm\SKT148

Enclosure

c/enc: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

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TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
AIR PROGRAMS REPORT

NITROGEN OXIDES - BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION
SOURCE EMISSION TEST #3

POLK POWER GENERATING STATION
AIRS # 1050233

UNIT NO.1 COMBUSTION TURBINE &
HEAT RECOVERY STEAM GENERATOR
FIRED ON SYNGAS

FEBRUARY 7, 2000

Prepared by Tampa Electric Company
Corporate Environmental Services
February 22, 2000

RECEIVED

MAR 08 2000

BUREAU OF AIR REGULATION

REPORT CERTIFICATION

I have calculated and reviewed all data in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 3/3/2000 Signature

QA/QC Coordinator
Senior Environmental Technician
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

The sampling and analysis performed for this report were carried out under my direction, and I hereby certify that this test report is authentic and accurate.

Date 3/7/00 Signature

Test Team Leader
Senior Environmental Technician
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 3/7/00 Signature

Air Administrator
Air Programs
Tampa Electric Company

TABLE OF CONTENTS

SECTION **PAGE NO.**

APPENDICES

1.0 SUMMARY OF RESULTS

On February 7, 2000, Corporate Environmental Services, Air Services and Auditing group of Tampa Electric Company performed source emission tests on IGCC Unit No. 1 at the Polk Power Electrical Generating Station. The combustion turbine was fired with syngas from a coal gasification system. This test was conducted to satisfy requirements in Title V permit no. 1050233-001-AV for NOx Best Available Control Technology (BACT) determinations. Testing was performed according to USEPA test methods stipulated in 40 CFR Part 60, Appendix A.

The Nitrogen Oxides (NO_x) emission rate was derived from three test runs. The calculated average was 19 ppm corrected to 15% oxygen on a dry basis.

During the tests on February 7, 2000, Unit No. 1 Combustion Turbine was operated at an average load of 192 megawatts. Details of turbine operation are included in Appendix C.

2.0 SOURCE DESCRIPTION/TEST PROCEDURES

Polk Power Electrical Generating Station is located at County Road 630 approximately 13 miles southwest of Bartow, Polk County, Florida. Unit No. 1 is a IGCC generating unit, 192 MW capacity when fired with Syngas fuel. The source sampling location consists of a circular stack 19 ft. in diameter with four sample ports located 90° apart on the stack circumference. A diagram of the stack sampling location is included in Figure 1 and 2 along with other pertinent information on the test site.

Nitrogen Oxides sampling was performed in accordance with USEPA Reference Method 20 (40 CFR Part 60, Appendix A) "Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines". Testing was performed using a Thermo Environmental Model 10 A/R Chemiluminescent NO-NO_x Gas Analyzer. Details of fuel bound nitrogen is found in Appendix B.

Diluent sampling was performed in accordance with USEPA Reference Method 3-A (40 CFR Part 60, Appendix A), "Determination of Oxygen and Carbon Dioxide concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)". Testing was performed using a Servomex 1400 B Oxygen Analyzer.

TCEMS Description

The following discussion briefly outlines the operation principles of Corporate Environmental Services Transportable Continuous Emissions Monitoring System (TCEMS). Additional information on instrument operation may be found in the individual instrument manuals provided by the manufacturers. A schematic of the TCEMS set-up is presented in Figure 3.

Servomex Model 1400 B O_2 Analyzer

The Servomex 1400B oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

Thermo Environmental Instruments Model 10A/R NO/NOx Analyzer

The Thermo Environmental Instruments model 10A/R NO/NOx analyzer automatically and continuously determines the concentration of nitric oxide (NO) and/or oxides of nitrogen (NO_x) in a flowing gas mixture. The analytical technique is chemiluminescence.

To measure NO concentrations, the gas sample to be analyzed is blended with ozone (O_3) in a reaction chamber. The resulting chemiluminescence activity is monitored through an optical filter by a high sensitivity photomultiplier tube positioned at one end of the chamber.

This filter and photomultiplier combination responds to light of a narrow wavelength band unique to the NO/O_3 reaction, producing an interference free signal. The output from the photomultiplier is linearly proportional to the NO concentration.

To measure NO_x concentrations (i.e., NO plus NO_2), the sample gas flow is diverted through a NO_2-to-NO converter. The chemiluminescent action in the reaction chamber to the converter effluent is linearly proportional to the NO_x concentration entering the converter.

Data Acquisition System

The data acquisition system (DAS) developed by Entropy Environmentalists Inc., uses a portable personal computer with an internal 32 bit analog-to-digital converter with an external 16 channel multiplexer. In addition to providing an instantaneous display of analyzer responses, the DAS can average data, calculate emission rates, and document analyzer calibrations. The test results and calibrations are stored on the hard disk and printed on a dot matrix printer.

TCEMS Sample Handling System

The extractive monitors utilized in the TCEMS require that the effluent stream be conditioned to eliminate any possible interference (i.e., water vapor and particulate matter), before being transported and injected into each analyzer. Figure 3 depicts a schematic of the entire sample handling system. The major components of this system are listed below:

- Gas transport tubing
- Moisture removal system
- Sampling pump

Gas Transport Tubing

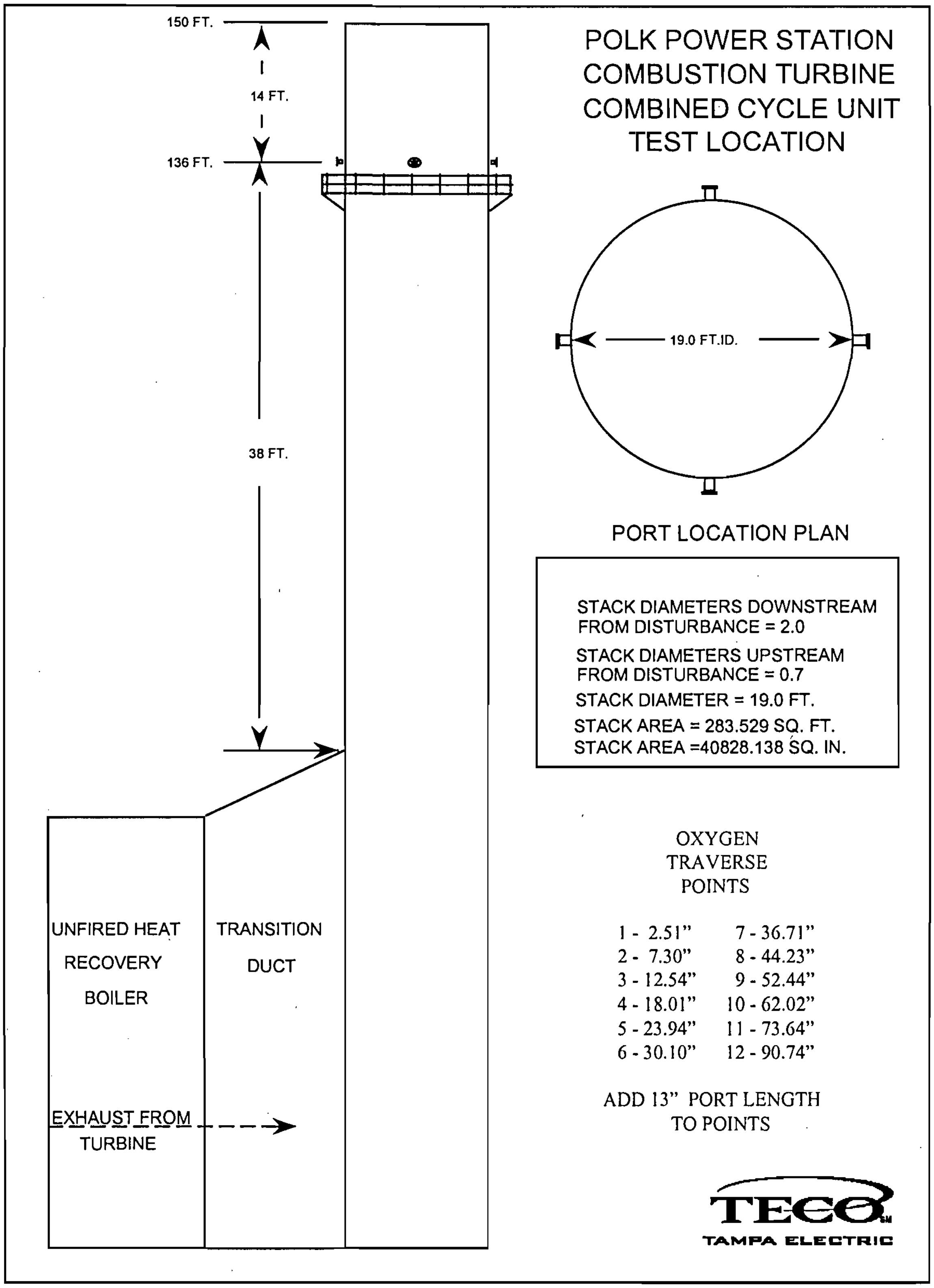
Two separate 1/4 inch O.D. Teflon tubes were used for the sample gas transport.

Moisture Removal System

The moisture removal system was comprised of an ice bath condenser, constructed of a 30-foot section of 3/8 inch O.D. Teflon tubing wrapped in a 12-inch coil. Effluent travels through this coil and then passes, in series, through two stainless steel moisture traps where the condensate drops out and is removed via a condensate discharge pump. With the exception of the discharge pump, the entire assembly is chilled in an ice bath.

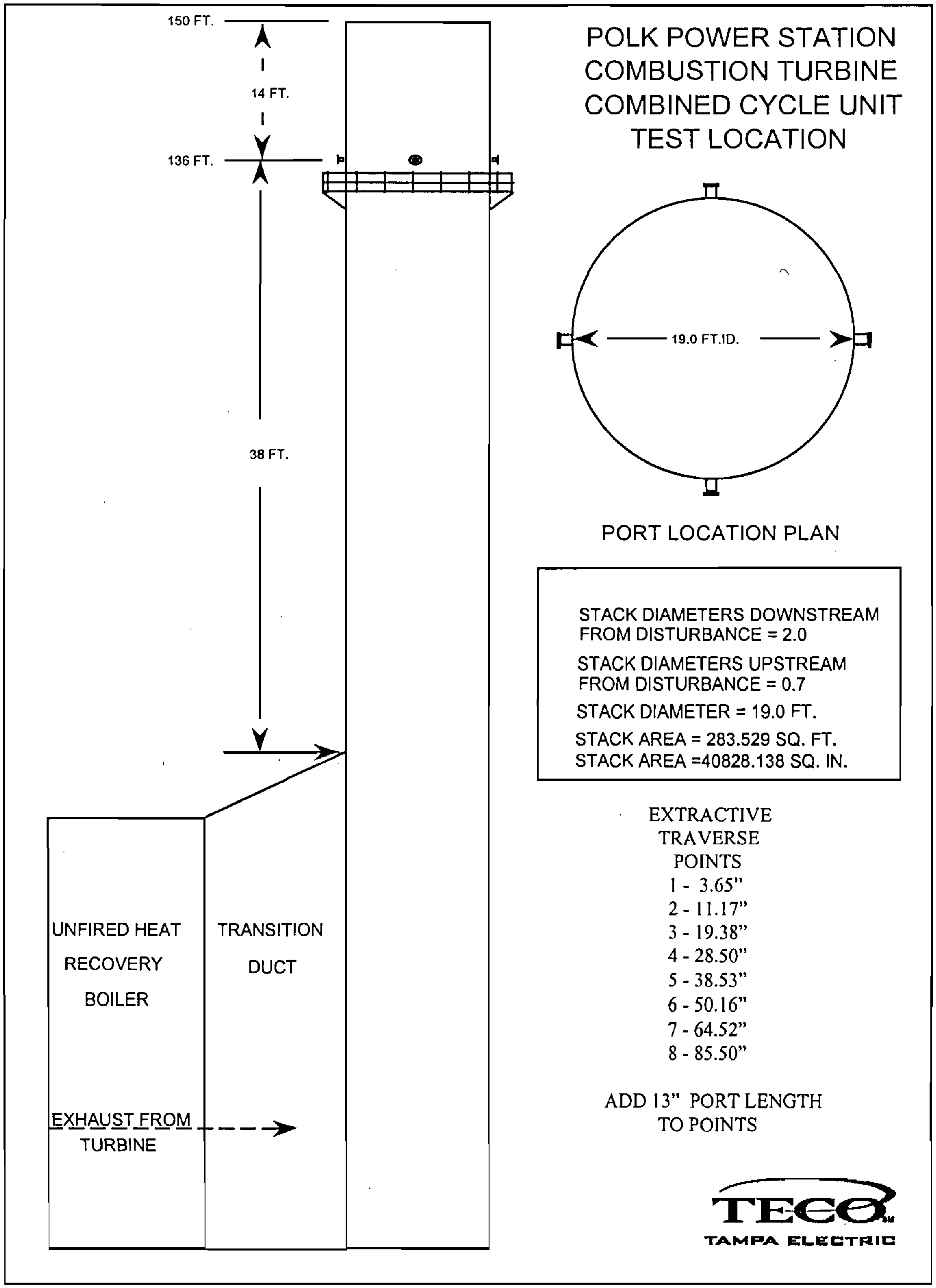
Sampling Pump

The Thomas Model 2107CE20-TFE pump is used to transport the effluent sample through the conditioning system to the analyzers. All internal parts of the pump that come into contact with the gas sample are constructed of 316 stainless steel or Teflon.



POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION
150 FT.
14 FT.
136 FT.
38 FT.
19.0 FT.ID.
PORT LOCATION PLAN
STACK DIAMETERS DOWNSTREAM FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.
OXYGEN TRAVERSE POINTS
1 - 2.51”
2 - 7.30”
3 - 12.54”
4 - 18.01”
5 - 23.94”
6 - 30.10”
7 - 36.71”
8 - 44.23”
9 - 52.44”
10 - 62.02”
11 - 73.64”
12 - 90.74”
ADD 13” PORT LENGTH TO POINTS
UNFIRED HEAT RECOVERY BOILER
TRANSITION DUCT
EXHAUST FROM TURBINE
TECO
TAMPA ELECTRIC

FIGURE 1


POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION
150 FT.
14 FT.
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PORT LOCATION PLAN
STACK DIAMETERS DOWNSTREAM FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.
EXTRACTIVE
TRAVERSE
POINTS
1 - 3.65”
2 - 11.17”
3 - 19.38”
4 - 28.50”
5 - 38.53”
6 - 50.16”
7 - 64.52”
8 - 85.50”
ADD 13” PORT LENGTH
TO POINTS
UNFIRED HEAT
RECOVERY
BOILER
TRANSITION
DUCT
EXHAUST FROM
TURBINE
TECO
TAMPA ELECTRIC

FIGURE 2

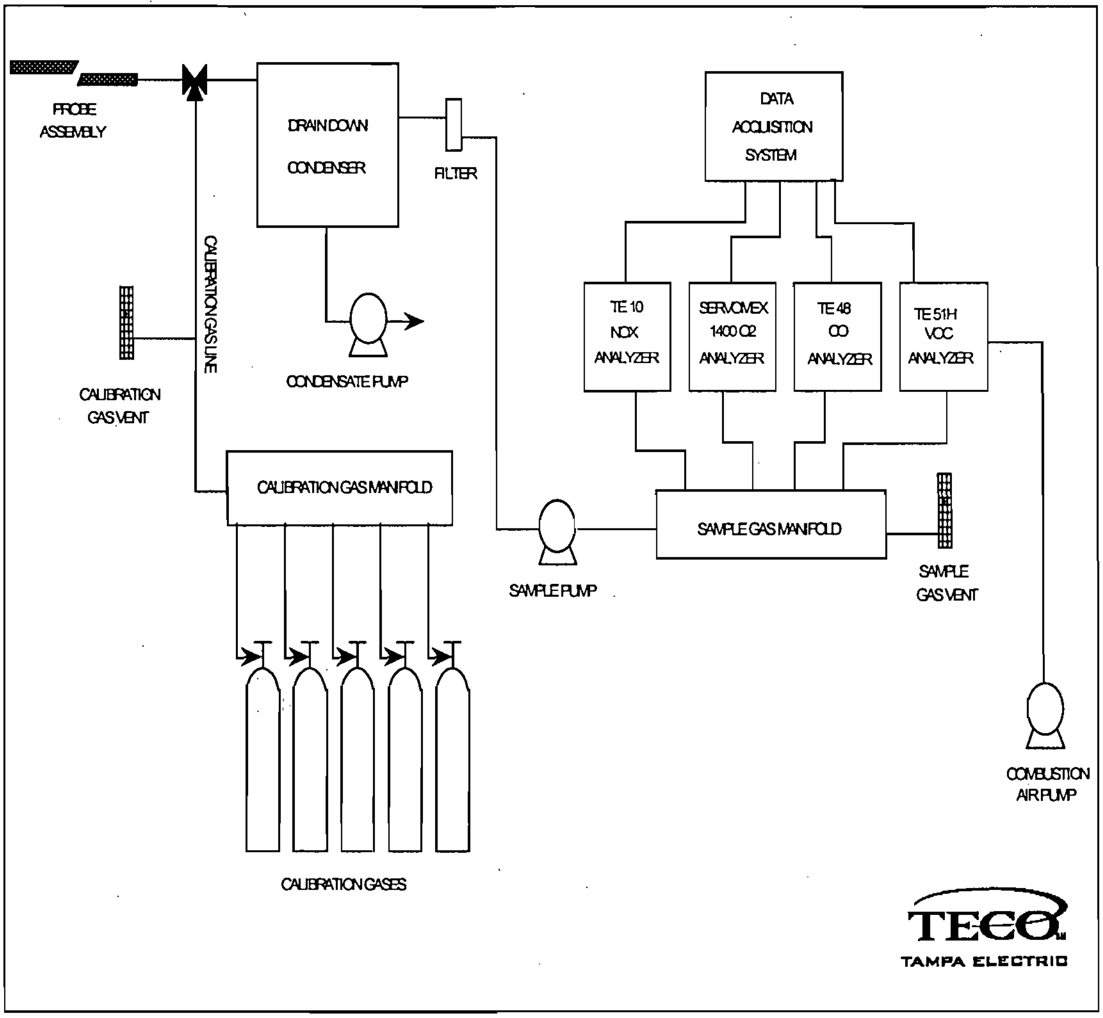

FIGURE 3
Extractive Method Sampling Trains
USEPA METHODS 3A, 10, 20, 25A

3.0 TEST RESULTS

IGCC COMBUSTION TURBINE UNIT 1
FEBRUARY 7, 2000

RUN NO.	TIME	O2%	ppm NOx Dry	CORRECTED 15% O2
1	1320 – 1420	11.9	29.0	19.0
2	1424 – 1524	11.7	30.0	19.2
3	1528 – 1628	11.8	29.0	18.8
	Average	11.8	29.3	19.0

Corrected NOx calculated as:

Concentration (ppm NOx) x (Cd / (20.9 - %O_2))

Where:
Cd = NOx coefficient of 5.9

APPENDIX A

SOURCE TEST CALCULATIONS

APPENDIX A - 1

NITROGEN OXIDE CALCULATIONS

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	2.7	1.5	2.1
24.0 ppm NOx	25.7	24.1	24.9
0.00 % Oxygen	0.51	0.69	0.60
11.96 % Oxygen	12.04	12.21	12.12

$\bar{C}(NOx) =$ 29.4 $\bar{C}(O2) =$ 12.03

CORRECTED RESULTS

29 ppm NOx
11.9 % Oxygen
19.0 ppm NOx @15% O2

Corr. Conc. = $\bar{C}ma(C - Co)/(Cm - Co)$ (for NOx)

Corr. Conc. = $[(Cma - Coa)/(Cm - Co)](\bar{C} - Cm) + Cma$ (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8094
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	1.5	3.4	2.4
24.0 ppm NOx	24.1	25.9	25.0
0.00 % Oxygen	0.69	0.66	0.67
11.96 % Oxygen	12.21	12.15	12.18

$\bar{C}$(NOx) = 30.6 $\bar{C}$(O2) = 11.96

CORRECTED RESULTS

30 ppm NOx
11.7 % Oxygen
19.2 ppm NOx @15% O2

Corr. Conc. = $C_{ma}(\bar{C} - C_o)/(C_m - C_o)$ (for NOx)

Corr. Conc. = $[(C_{ma} - C_{oa})/(C_m - C_o)](\bar{C} - C_m) + C_{ma}$ (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

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1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	3.4	0.5	1.9
24.0 ppm NOx	25.9	23.0	24.5
0.00 % Oxygen	0.66	0.40	0.53
11.96 % Oxygen	12.15	12.24	12.19

$\bar{C}$(NOx) = 29.3 $\bar{C}$(O2) = 12.02

CORRECTED RESULTS

29 ppm NOx
11.8 % Oxygen
18.8 ppm NOx @15% O2

Corr. Conc. = $C_{ma}(\bar{C} - C_o)/(C_m - C_o)$ (for NOx)

Corr. Conc. = $[(C_{ma} - C_{oa})/(C_m - C_o)](\bar{C} - C_m) + C_{ma}$ (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

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1.194E-07

APPENDIX A - 2

OXYGEN CALCULATIONS

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 1

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.51	0.69	0.60
11.96 % Oxygen	12.04	12.21	12.12

$\bar{C}$ = 12.03

CORRECTED RESULTS

11.9 % Oxygen

Corrected Conc. = Cma($\bar{C}$ - Co)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 2

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.69	0.66	0.67
11.96 % Oxygen	12.21	12.15	12.18

$\bar{C}$ = 11.96

CORRECTED RESULTS

11.7 % Oxygen

Corrected Conc. = Cma($\bar{C}$ - Co)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 3

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.66	0.40	0.53
11.96 % Oxygen	12.15	12.24	12.19

$\bar{C}$ = 12.02

CORRECTED RESULTS

11.8 % Oxygen

Corrected Conc. = Cma(C - $\bar{C}$o)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

APPENDIX B

TURBINE DATA

All values are averages for time period given

			TEST PERIOD 1
		START TIME	36563.5
		END TIME	36563.708
1TSYFI910	GT SYNGAS MASS FLOW	LB/SEC	102.6405
1PWRJI900	GT GEN LOAD WATTS	MW	191.79012
1GMLJI962	GT GENERATOR WATTS	MW	192.71425
1TSYJYI910	GT SYNGAS LOWER HEATING VA	BTU/LB	245.93356
1NITFI920A	GT N2 FLOW	LB/SEC	117.20995
1TMSTI922M	GT CPRSR MAX INL FLANGE TE	F	70.717781
1TMSPI909	AMBIENT BAR PRESS	IN HGA	30.111511

1 MINUTE AVERAGES

TEST PERIOD 1
36563.5
36563.71

	GT SYNGAS 1TSYFI910	GT GEN LOAD 1PWRJI900	GT GENERATOR 1GMLJI962	GT SYNGAS LOWER I 1TSYJYI910	GT N2 FLOW 1NITFI920A	GT CPRSR MAX 1TMSTI922M	INL FLANGE	AMBIENT BP 1TMSPI909
36563.5	102.2705	191.8515015	192.7159271	246.4013214	116.7663345		67.91618347	30.14540291
36563.5	102.71859	191.8538208	192.7186127	246.3991394	116.7692947		67.7119751	30.14517593
36563.5	102.331352	191.7322388	192.7212982	246.3969421	116.7722549		67.50776672	30.14495087
36563.5	102.670265	191.8231964	192.7239838	246.3947601	116.7752075		67.63648224	30.14472389
36563.5	102.08963	192.0078125	192.7266693	246.3925629	116.7781677		67.55435181	30.14449883
36563.5	102.524895	191.9920654	192.7293549	246.3903809	116.7811203		67.24636078	30.14427376
36563.5	102.303993	191.9763031	192.7320404	246.3881989	116.7840805		67.48679352	30.14404678
36563.5	102.404861	191.9605408	192.734726	246.3860016	116.7870407		67.80727386	30.14382172
36563.51	102.258034	191.5700836	192.7374115	246.3838196	116.7899933		67.90937805	30.14359474
36563.51	102.32106	191.5019836	192.740097	246.3816223	116.7929535		68.01148224	30.14336967
36563.51	102.429352	191.9842224	192.7427826	246.3794403	116.7959137		67.90853882	30.1431427
36563.51	102.482941	191.7832489	192.7454681	246.377243	116.7988663		67.97088623	30.14291763
36563.51	102.411415	191.7526703	192.7481537	246.375061	116.8018265		68.4291153	30.14269066
36563.51	102.511063	191.3941803	192.7508392	246.3728638	116.8047867		68.68877411	30.14246559
36563.51	102.759865	191.5247498	192.7535248	246.3706818	116.8077393		69.07376099	30.14223862
36563.51	102.677765	191.5456085	192.7562103	246.3684845	116.8106995		69.7091217	30.14201355
36563.51	102.491646	191.858963	192.7588959	246.3663025	116.8136597		69.91159821	30.14178658
36563.51	102.276306	191.8827972	192.7615814	246.3641205	116.8166122		70.11406708	30.14156151
36563.51	102.615974	192.0717621	192.764267	246.3619232	116.8195724		69.7359314	30.14133644
36563.51	102.194366	191.624176	192.7669525	246.3597412	116.8225327		69.5100708	30.14110947
36563.51	102.381531	191.6872101	192.7696381	246.3575439	116.8254852		69.94125366	30.1408844
36563.51	102.171432	191.7910767	192.7723236	246.3553619	116.8284454		70.10593414	30.14065742
36563.52	102.219154	191.59552	192.7750092	246.3531647	116.831398		70.24567413	30.14043236
36563.52	102.794052	191.6714478	192.7776947	246.3509827	116.8343582		70.55879211	30.14020538
36563.52	102.315369	191.6965179	192.7807007	246.3487854	116.8373184		70.68404388	30.13998032
36563.52	102.624031	191.9058838	192.783844	246.3466034	116.840271		71.46968842	30.13975334

36563.52	102.522942	191.7449341	192.7870026	246.3444061	116.8432312	71.31442261	30.13952827
36563.52	102.671288	191.8214722	192.7901459	246.3422241	116.8461914	71.67267609	30.1393013
36563.52	102.23243	192.459137	192.7932892	246.3400421	116.849144	71.14910126	30.13907623
36563.52	102.290451	191.6366425	192.7964478	246.3378448	116.8521042	70.93350983	30.13885117
36563.52	102.842339	191.6321411	192.7995911	246.3356628	116.8550644	71.49815369	30.13862419
36563.52	102.732475	192.3941803	192.8027496	246.3334656	116.858017	71.16938019	30.13839912
36563.52	102.537437	191.9763794	192.8058929	246.3312836	116.8609772	70.56922913	30.13817215
36563.52	102.2528	191.3397675	192.8090515	246.3290863	116.8639374	71.18503571	30.13794708
36563.52	102.161674	191.6069336	192.8121948	246.3269043	116.86689	71.49815369	30.13772011
36563.52	102.121033	191.8740845	192.8153534	246.324707	116.8698502	70.57418823	30.13749504
36563.53	102.320778	192.1412506	192.8184967	246.322525	116.8728104	70.85675812	30.13726807
36563.53	102.168472	191.8968964	192.8216553	246.320343	116.8757629	72.71502686	30.137043
36563.53	102.684715	191.6349945	192.8247986	246.3181458	116.8787231	72.39338684	30.13681602
36563.53	102.575272	191.9348755	192.8279572	246.3159637	116.8816833	72.07174683	30.13659096
36563.53	102.543106	191.8290863	192.8311005	246.3137665	116.8846359	71.75010681	30.13636398
36563.53	102.273628	191.6708527	192.8342438	246.3115845	116.8875961	71.29462433	30.13613892
36563.53	102.513611	191.512619	192.8374023	246.3093872	116.8905487	70.7507019	30.13591385
36563.53	102.428391	191.3415527	192.8405457	246.3072052	116.8935089	70.32266998	30.13568687
36563.53	102.798012	191.7629395	192.8437042	246.3050079	116.8964691	70.78465271	30.13546181
36563.53	102.348679	191.6603088	192.8468475	246.3028259	116.8994217	71.18503571	30.13523483
36563.53	102.611633	191.5576782	192.8500061	246.3006287	116.9023819	71.24663544	30.13500977
36563.53	102.224365	191.8050385	192.8296814	246.2984467	116.9053421	71.81127167	30.13478279
36563.53	102.768341	191.775177	192.7967224	246.2962646	116.9082947	71.81127167	30.13455772
36563.53	102.309334	192.1288147	192.7637634	246.2940674	116.9112549	72.1205368	30.13433075
36563.53	102.653664	192.0569458	192.7308044	246.2918854	116.9142151	72.04354095	30.13410568
36563.54	102.560844	191.6034851	192.6978455	246.2896881	116.9171677	71.9665451	30.13387871
36563.54	102.504189	191.4739685	192.6648712	246.2875061	116.9201279	71.88954926	30.13365364
36563.54	102.869171	191.8415527	192.6319122	246.2853088	116.9230881	71.81255341	30.13342667
36563.54	103.116852	191.7600555	192.5989532	246.2831268	116.9260406	71.29858398	30.1332016
36563.54	102.509842	191.6785583	192.5659943	246.2809296	116.9290009	71.09212494	30.13297653
36563.54	102.309029	191.7793732	192.5330353	246.2787476	116.9319611	70.88567352	30.13274956
36563.54	102.193726	191.7913818	192.5000763	246.2765503	116.9349136	70.55879211	30.13252449
36563.54	102.351601	191.6246338	192.606369	246.2743683	116.9378738	70.55879211	30.13229752
36563.54	102.47654	191.7261047	192.7876587	246.2721863	116.9408264	70.02865601	30.13207245
36563.54	102.405693	191.852005	192.8475342	246.269989	116.9437866	69.41696167	30.13184547
36563.54	102.394714	191.6486053	192.842041	246.267807	116.9467468	69.57167053	30.13162041
36563.54	102.481003	191.9000854	192.8365479	246.2656097	116.9496994	70.36365509	30.13139343

36563.54	102.400894	191.8619232	192.8310547	246.2634277	116.9526596	70.80004883	30.13116837
36563.54	102.532043	191.7769775	192.8255615	246.2612305	116.9556198	70.3917923	30.13094139
36563.55	102.498856	191.930069	192.8200684	246.2590485	116.9585724	70.32780457	30.13071632
36563.55	102.204887	191.8634033	192.8145752	246.2568512	116.9615326	69.36299133	30.13048935
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36563.55	102.581627	191.8408661	192.8035889	246.2524872	116.9674454	70.30356598	30.13003922
36563.55	102.7444	191.5736694	192.7980957	246.2502899	116.9704056	70.76300049	30.12981224
36563.55	102.386696	191.6304016	192.7926025	246.2481079	116.9733658	71.06931305	30.12958717
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36563.55	102.34481	192.0447388	192.7706146	246.2393494	116.9851913	72.58379364	30.12868309
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36563.55	102.537918	192.0633545	192.7541351	246.2327728	116.9940643	72.30220032	30.12800407
36563.55	102.40789	191.8396606	192.748642	246.2305908	116.9970245	72.32672119	30.12777901
36563.55	102.71096	192.0053406	192.7431488	246.2284088	116.9999771	72.20648956	30.12755203
36563.56	102.480927	191.7666931	192.7376556	246.2262115	117.0029373	72.38893127	30.12732697
36563.56	102.513702	191.9074097	192.7321625	246.2240295	117.0058975	72.32615662	30.1271019
36563.56	102.413223	191.862381	192.7077942	246.2218323	117.0088501	71.89554596	30.12687492
36563.56	102.681366	191.7819366	192.6732635	246.2196503	117.0118103	71.4649353	30.12664986
36563.56	102.65786	191.8841248	192.6387329	246.217453	117.0147705	71.29462433	30.12642288
36563.56	102.473793	191.99263	192.6042175	246.215271	117.0177231	71.61621094	30.12619781
36563.56	102.461182	192.1011353	192.5696869	246.2130737	117.0206833	71.18503571	30.12597084
36563.56	102.488449	192.2096405	192.5351563	246.2108917	117.0236435	71.01050568	30.12574577
36563.56	102.209396	191.9303741	192.5006256	246.2086945	117.0265961	70.96944427	30.1255188
36563.56	102.71817	192.0474396	192.547699	246.2065125	117.0295563	71.81127167	30.12529373
36563.56	102.307716	191.4368134	192.6387177	246.2043304	117.0325165	71.81127167	30.12506676
36563.56	102.500809	191.7145386	192.7297516	246.2021332	117.0354691	71.81127167	30.12484169
36563.56	102.433189	192.1567078	192.8207703	246.1999512	117.0384293	71.55461884	30.12461472
36563.56	102.095413	191.5246735	192.8367767	246.1977539	117.0413895	71.72709656	30.12438965
36563.57	102.171799	191.8259277	192.8152924	246.1955719	117.044342	71.22206879	30.12416458
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36563.57	102.189857	191.8421631	192.7508392	246.1889954	117.053215	70.35517883	30.12348557
36563.57	102.453903	191.6761475	192.7293549	246.1868134	117.0561752	70.45783997	30.1232605
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36563.57	102.547302	191.8964539	192.6863708	246.1824341	117.062088	71.18503571	30.12280846
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36563.57	102.452332	191.8445282	192.6635895	246.1780548	117.0680008	72.28292847	30.12235641
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36563.57	102.386444	191.5210724	192.6987457	246.1692963	117.079834	70.58984375	30.12145233
36563.57	102.458031	191.9688416	192.7075348	246.1671143	117.0827942	70.900383	30.12122726
36563.58	102.066849	191.5738678	192.7163239	246.164917	117.0857468	71.5135498	30.12100029
36563.58	102.205421	191.6060333	192.7251129	246.162735	117.088707	71.7599411	30.12077522
36563.58	102.107002	191.5761566	192.733902	246.160553	117.0916672	70.24567413	30.12054825
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36563.58	102.627037	191.6052704	192.7690735	246.1517944	117.1034927	72.12438965	30.11964417
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36563.58	102.208168	191.6010742	192.8130188	246.1408386	117.1182785	71.45709229	30.11851501
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36563.58	102.343208	192.1274414	192.8305969	246.1364746	117.1241989	70.37593079	30.11806297
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36563.59	102.218185	191.8335571	192.848175	246.1320953	117.1301117	69.70513153	30.11761093
36563.59	102.261696	191.5286713	192.64505	246.1298981	117.1330719	69.3971405	30.11738586
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36563.61	103.201546	191.7670746	192.7127228	246.0505829	117.2158813	71.88274384	30.11105919
36563.61	102.665985	191.8661346	192.7061005	246.0448151	117.2188339	71.67853546	30.11083221
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36563.61	102.61834	192.0930634	192.9988098	245.9929657	117.2454529	73.95508575	30.10879898
36563.61	102.680641	191.9759216	192.9665833	245.9872131	117.2484131	74.05718994	30.10857391
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36563.62	102.507935	191.7507935	192.7409821	245.9468842	117.2691193	73.37444305	30.10699272
36563.62	102.654503	191.9874878	192.744339	245.9411316	117.2720718	73.16912079	30.10676575
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36563.63	102.678719	192.0387878	192.7987366	245.8892822	117.2986908	74.00289917	30.10473251
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36563.63	102.526703	192.1448364	192.8987427	245.8374481	117.3253098	71.20339203	30.10269928
36563.63	102.424263	191.6129303	192.8265228	245.8316803	117.3282623	70.95860291	30.10247231
36563.63	102.793434	191.621933	192.7543182	245.8259277	117.3312225	70.71382141	30.10224724
36563.63	102.436142	191.6855927	192.7302399	245.8201599	117.3341827	70.67172241	30.10202026
36563.63	102.457657	191.7615204	192.7302399	245.8144073	117.3371353	70.65272522	30.1017952
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36563.64	102.488052	191.8388062	192.7285004	245.7913666	117.3489685	70.38181305	30.10089111
36563.64	102.679451	191.7492065	192.7258911	245.7855988	117.3519287	70.89233398	30.10066605
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36563.64	102.445755	191.9055328	192.7206573	245.7740784	117.3578415	71.7804718	30.100214
36563.64	102.882339	191.9730682	192.7180481	245.7683105	117.3608017	71.6264801	30.09998703
36563.64	102.256691	191.7366943	192.7154236	245.762558	117.3637543	71.54906464	30.09976196
36563.64	102.796104	191.7748718	192.7128143	245.7567902	117.3667145	71.85454559	30.09953499
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36563.64	102.845695	191.9608154	192.7049713	245.7395172	117.3755875	71.48532104	30.09885788
36563.64	103.166527	191.8869629	192.7023621	245.7337494	117.3785477	71.33132935	30.09863091
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36563.65	102.777191	191.6654205	192.694519	245.7164764	117.387413	70.8719101	30.0979538

36563.65	103.139198	191.9546051	192.6919098	245.7107086	117.3903732	70.8719101	30.09772873
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36563.65	102.994759	192.0345306	192.6840668	245.6934357	117.3992462	70.86506653	30.09704971
36563.65	102.799004	192.0142212	192.6814575	245.6876678	117.4022064	71.12343597	30.09682465
36563.65	102.966972	191.456955	192.678833	245.6819153	117.405159	70.91231537	30.09659767
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36563.65	103.103806	191.8328094	192.6736145	245.6703949	117.4110794	70.92108154	30.09614563
36563.65	102.986389	191.7247467	192.6710052	245.6646271	117.414032	70.61054993	30.09592056
36563.65	102.971771	191.6404877	192.6683807	245.6588745	117.4169922	71.2685318	30.09569359
36563.65	102.846382	191.6344452	192.6657715	245.6531067	117.4199524	71.3184967	30.09546852
36563.65	102.625008	191.6284027	192.6631622	245.6473541	117.422905	71.14104462	30.09524345
36563.65	102.82766	191.9755402	192.6605377	245.6415863	117.4258652	70.67523956	30.09501648
36563.66	103.139893	191.5982056	192.6579285	245.6358337	117.4288254	70.64605713	30.09479141
36563.66	102.764366	191.7206116	192.6553192	245.6300659	117.431778	70.65272522	30.09456444
36563.66	103.080231	191.8430176	192.65271	245.6243134	117.4347382	70.8719101	30.09433937
36563.66	103.014618	191.9401245	192.6500854	245.6185455	117.4376984	70.46788788	30.0941124
36563.66	102.701805	191.8095398	192.6474762	245.612793	117.4406509	70.3440094	30.09388733
36563.66	102.973267	192.1131744	192.6448669	245.6070251	117.4436111	70.49927521	30.09366035
36563.66	103.025299	191.8536987	192.6422577	245.6012726	117.4465637	71.24149323	30.09343529
36563.66	102.786957	191.6286774	192.6396332	245.5955048	117.4495239	71.49815369	30.09320831
36563.66	103.164436	191.9348755	192.6370239	245.5897522	117.4524841	70.98997498	30.09298325
36563.66	102.865814	191.5158539	192.6344147	245.5839844	117.4554367	70.55879211	30.09275627
36563.66	102.694786	191.8641815	192.6317902	245.5782318	117.4583969	70.55879211	30.0925312
36563.66	103.083633	191.9047089	192.6291809	245.572464	117.4613571	70.40223694	30.09230614
36563.66	103.185783	191.5444794	192.6265717	245.5667114	117.4643097	70.32010651	30.09207916
36563.66	103.190102	191.7643738	192.6239624	245.5609436	117.4672699	70.47409821	30.0918541
36563.67	103.172089	191.656311	192.6213379	245.555191	117.4702301	70.6676178	30.09162712
36563.67	103.230904	191.548233	192.6187286	245.5494232	117.4731827	70.21363831	30.09140205
36563.67	103.087097	191.8031616	192.6161194	245.5436554	117.4761429	70.22264099	30.09117508
36563.67	103.128151	191.9351807	192.6134949	245.5379028	117.4791031	70.16255951	30.09095001
36563.67	103.083313	191.5796356	192.6108856	245.532135	117.4820557	70.10247803	30.09072304
36563.67	102.925537	191.8127747	192.6082764	245.5263824	117.4850159	70.04239655	30.09049797
36563.67	103.040558	191.6101532	192.6056671	245.5206146	117.4879761	69.98230743	30.090271
36563.67	103.125565	191.8551941	192.6030426	245.5148621	117.4909286	69.72206879	30.09004593
36563.67	102.784737	191.7465363	192.6004333	245.5090942	117.4938889	69.75675964	30.08981895
36563.67	102.889183	191.6378632	192.5978241	245.5033417	117.4968414	70.21073914	30.08959389

36563.67	103.048187	191.424469	192.5951996	245.4975739	117.4998016	70.7384491	30.08936882
36563.67	103.274689	191.6556091	192.5925903	245.4918213	117.5027618	71.50841522	30.08914185
36563.67	103.263657	191.8867493	192.5899811	245.4860535	117.5057144	71.86867523	30.08891678
36563.67	103.118332	192.0641174	192.5873718	245.4803009	117.5086746	71.86592865	30.0886898
36563.68	102.788712	191.6055756	192.5847473	245.4745331	117.5116348	72.19387817	30.08846474
36563.68	102.869728	191.9074097	192.5821381	245.4687805	117.5145874	72.5218277	30.08823776
36563.68	103.068527	191.9074097	192.5795288	245.4630127	117.5175476	72.5925293	30.0880127
36563.68	102.856514	191.9074097	192.5769043	245.4572601	117.5205078	70.83358765	30.08778572
36563.68	102.950172	191.8791809	192.574295	245.4514923	117.5234604	70.37374878	30.08756065
36563.68	102.918953	191.8662109	192.5716858	245.4457397	117.5264206	69.91390991	30.08733368
36563.68	103.267319	191.7671051	192.5690765	245.4399719	117.5293808	69.45407104	30.08710861
36563.68	103.161873	191.4768066	192.566452	245.4342194	117.5323334	68.68877411	30.08688164
36563.68	103.159126	191.6322937	192.5638428	245.4284515	117.5352936	68.68877411	30.08665657
36563.68	103.002335	191.9279633	192.5612335	245.422699	117.5382538	68.67604828	30.0864315
36563.68	102.656578	191.603775	192.558609	245.4169312	117.5412064	68.98152924	30.08620453
36563.68	102.684769	191.6710052	192.5559998	245.4111786	117.5441666	68.42698669	30.08597946
36563.68	102.908073	191.6755066	192.5533905	245.4054108	117.5471268	68.28205872	30.08575249
36563.68	103.015305	191.6800079	192.5507813	245.3996582	117.5500793	68.17995453	30.08552742
36563.68	102.962563	191.6845093	192.5481567	245.3938904	117.5530396	68.07784271	30.08530045
36563.69	102.865295	191.6849823	192.5455475	245.3881378	117.5559921	67.8007431	30.08507538
36563.69	102.837463	191.6759949	192.5429382	245.38237	117.5589523	68.26272583	30.0848484
36563.69	102.841728	191.6670227	192.540329	245.3766174	117.5619125	68.11993408	30.08462334
36563.69	103.21254	191.6580505	192.5377045	245.3708496	117.5648651	68.12926483	30.08439636
36563.69	103.116852	191.6490784	192.5616608	245.365097	117.5678253	67.8212738	30.0841713
36563.69	102.885643	192.0051117	192.5979156	245.3593292	117.5707855	67.83154297	30.08394623
36563.69	102.720657	191.7889862	192.6180878	245.3535767	117.5737381	67.9752655	30.08371925
36563.69	102.765045	191.6863251	192.6307983	245.3478088	117.5766983	67.8418045	30.08349419
36563.69	103.067719	192.0297241	192.6435242	245.3420563	117.5796585	67.95643616	30.08326721
36563.69	102.729958	191.7106323	192.65625	245.3362885	117.5826111	67.80117035	30.08304214
36563.69	103.235405	191.6782837	192.6689758	245.3305359	117.5855713	67.633255	30.08281517
36563.69	102.977798	191.7854767	192.6816864	245.3247681	117.5885315	67.55632019	30.0825901
36563.69	102.647179	191.8849945	192.6944122	245.3190002	117.5914841	67.93728638	30.08236313
36563.69	102.682266	191.7619171	192.7071381	245.3132477	117.5944443	67.83924103	30.08213806
36563.7	102.68235	191.6388397	192.7198639	245.3074799	117.5974045	67.99323273	30.08191109
36563.7	103.031708	191.5157623	192.7325745	245.3017273	117.6003571	67.9502182	30.08168602
36563.7	102.766914	191.6460114	192.7453003	245.2959595	117.6033173	67.74600983	30.08145905
36563.7	102.861641	191.7805328	192.7580261	245.2902069	117.6062698	67.54180145	30.08123398

36563.7	102.87545	191.9150696	192.770752	245.2844391	117.60923	67.58638763	30.08100891
36563.7	102.663658	192.0495911	192.7834625	245.2786865	117.6121902	67.89691162	30.08078194
36563.7	103.116852	191.8523254	192.7961884	245.2729187	117.6151428	67.74941254	30.08055687
36563.7	103.033188	191.957077	192.8089142	245.2671661	117.618103	67.43629456	30.0803299
36563.7	103.06485	191.6869202	192.82164	245.2613983	117.6210632	67.70835114	30.08010483
36563.7	102.833954	191.8935547	192.8343506	245.2556458	117.6240158	67.60569	30.07987785
36563.7	102.862335	191.7644653	192.8470764	245.2498779	117.626976	67.50302124	30.07965279
36563.7	102.726555	191.6353912	192.8098145	245.2441254	117.6299362	67.07141113	30.07942581
36563.7	102.731514	191.6487579	192.7493744	245.2383575	117.6328888	66.91614532	30.07920074
36563.7	103.184929	191.6130676	192.7247467	245.232605	117.635849	67.40566254	30.07897377
36563.7	102.584816	192.3697662	192.7166901	245.2268372	117.6388092	67.30355835	30.0787487
36563.71	102.936394	192.0062866	192.7086487	245.2210846	117.6417618	67.20145416	30.07852173
36563.71	103.197083	192.0203247	192.700592	245.2153168	117.644722	67.09934998	30.07829666
36563.71	102.59565	191.5947876	192.6925507	245.2095642	117.6476822	66.99724579	30.07807159
36563.71	102.612328	191.5973969	192.6845093	245.2037964	117.6501923	66.8951416	30.07784462
36563.71	102.892769	191.6291809	192.6764526	245.1980438	117.649353	66.83551025	30.07761955

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Record#	DATE	TIME	PC1GEN11	PC1OPA12	PC1CO213	PC1NOX14	PC1PRS15	PC1TMP16
1	02/07/2000	132000	191.085	1.198	8.096	30.052	30.088	289.427
2	02/07/2000	132100	191.205	0.829	8.096	29.947	30.085	290.173
3	02/07/2000	132200	191.188	0.946	8.080	29.836	30.084	295.083
4	02/07/2000	132300	191.143	1.044	8.046	29.818	30.082	294.395
5	02/07/2000	132400	191.002	1.418	8.004	29.482	30.084	293.276
6	02/07/2000	132500	191.314	1.325	8.031	29.605	30.084	293.241
7	02/07/2000	132600	191.470	1.299	8.082	30.198	30.086	293.293
8	02/07/2000	132700	191.244	1.175	8.091	30.322	30.082	294.028
9	02/07/2000	132800	191.370	1.761	8.087	30.218	30.079	294.451
10	02/07/2000	132900	191.472	1.729	8.024	30.050	30.077	290.042
11	02/07/2000	133000	191.351	1.794	7.992	29.798	30.077	289.051
12	02/07/2000	133100	191.254	2.052	7.984	29.611	30.077	289.037
13	02/07/2000	133200	191.231	2.383	7.979	29.678	30.079	289.440
14	02/07/2000	133300	191.381	1.843	8.008	30.104	30.080	293.447
15	02/07/2000	133400	191.252	1.753	8.039	30.027	30.078	289.389
16	02/07/2000	133500	191.224	1.534	8.045	29.902	30.079	282.319
17	02/07/2000	133600	191.350	1.798	8.055	30.012	30.078	282.297
18	02/07/2000	133700	191.440	2.111	8.103	30.518	30.079	282.296
19	02/07/2000	133800	191.494	2.215	8.083	30.301	30.075	290.732
20	02/07/2000	133900	191.340	2.474	8.077	30.286	30.075	293.164
21	02/07/2000	134000	191.285	2.462	8.067	29.690	30.078	286.680
22	02/07/2000	134100	191.241	2.468	8.082	30.173	30.076	284.340
23	02/07/2000	134200	191.464	2.050	8.088	30.455	30.076	284.355
24	02/07/2000	134300	191.132	1.770	8.121	30.509	30.076	284.325
25	02/07/2000	134400	191.092	1.877	8.101	30.491	30.076	292.274
26	02/07/2000	134500	190.958	2.021	8.091	30.602	30.076	289.873
27	02/07/2000	134600	191.225	2.146	8.046	30.167	30.074	283.559
28	02/07/2000	134700	191.554	1.868	8.077	30.254	30.074	283.668
29	02/07/2000	134800	191.373	1.613	8.059	29.971	30.073	283.653
30	02/07/2000	134900	191.308	1.431	8.094	30.033	30.073	291.030
31	02/07/2000	135000	191.158	1.886	8.063	30.239	30.072	293.800
32	02/07/2000	135100	191.353	1.932	8.078	30.486	30.069	289.745
33	02/07/2000	135200	191.343	1.903	8.052	30.351	30.069	288.910
34	02/07/2000	135300	191.361	1.731	8.060	30.561	30.069	288.939
35	02/07/2000	135400	191.554	1.544	8.068	30.330	30.071	289.094
36	02/07/2000	135500	191.355	1.630	8.113	30.459	30.072	294.295
37	02/07/2000	135600	191.771	1.658	8.102	30.307	30.072	293.052
38	02/07/2000	135700	191.134	2.215	8.120	29.968	30.070	285.012
39	02/07/2000	135800	191.542	1.648	8.089	29.963	30.068	284.991
40	02/07/2000	135900	191.192	1.548	8.076	30.078	30.066	284.913
41	02/07/2000	140000	190.709	1.608	8.058	30.202	30.068	289.412
42	02/07/2000	140100	190.906	2.337	8.081	30.652	30.068	293.132
43	02/07/2000	140200	191.121	2.583	8.108	30.546	30.067	293.187
44	02/07/2000	140300	191.514	2.160	8.136	30.738	30.065	293.154
45	02/07/2000	140400	191.767	2.303	8.099	30.676	30.064	293.124
46	02/07/2000	140500	191.245	2.347	8.055	30.306	30.065	284.852
47	02/07/2000	140600	191.197	2.026	8.082	30.222	30.063	284.866
48	02/07/2000	140700	191.337	2.226	8.052	30.087	30.065	284.860
49	02/07/2000	140800	191.015	2.318	8.063	30.071	30.065	288.556
50	02/07/2000	140900	191.247	2.395	8.093	30.466	30.065	293.790
51	02/07/2000	141000	191.036	2.219	8.085	30.482	30.063	288.003
52	02/07/2000	141100	191.384	2.193	8.040	30.321	30.065	282.517
53	02/07/2000	141200	191.651	2.012	8.052	30.353	30.066	282.532
54	02/07/2000	141300	191.286	2.609	8.116	30.374	30.064	282.521
55	02/07/2000	141400	191.258	2.175	8.139	30.409	30.062	291.360
56	02/07/2000	141500	191.048	2.049	8.175	30.444	30.063	294.767
57	02/07/2000	141600	191.161	1.918	8.136	30.375	30.062	290.215
58	02/07/2000	141700	191.468	1.901	8.123	30.735	30.062	288.755

59	02/07/2000	141800	191.307	2.048	8.115	30.883	30.062	288.744
60	02/07/2000	141900	191.019	2.303	8.139	30.918	30.062	289.202
61	02/07/2000	142000	190.925	1.834	8.141	30.629	30.060	293.128
62	/ /							
63	/ /	AVE	191.276	1.896	8.078	30.242	30.072	289.111

Run 2

Record#	DATE	TIME	PC1GEN11	PC1OPA12	PC1CO213	PC1NOX14	PC1PRS15	PC1TMP16
1	02/07/2000	142500	191.013	2.025	8.051	30.165	30.058	289.065
2	02/07/2000	142600	191.123	2.283	8.064	30.045	30.059	289.877
3	02/07/2000	142700	191.068	2.285	8.078	30.223	30.059	292.845
4	02/07/2000	142800	190.900	1.967	8.062	30.373	30.058	294.060
5	02/07/2000	142900	190.826	2.105	8.024	30.292	30.055	294.080
6	02/07/2000	143000	190.867	2.302	7.982	30.058	30.055	293.970
7	02/07/2000	143100	191.282	2.229	7.997	30.233	30.053	293.193
8	02/07/2000	143200	191.249	2.706	7.929	29.916	30.054	292.050
9	02/07/2000	143300	191.508	2.999	7.955	29.747	30.056	287.924
10	02/07/2000	143400	191.341	2.630	7.974	29.971	30.054	287.868
11	02/07/2000	143500	191.289	3.037	7.989	30.027	30.056	287.892
12	02/07/2000	143600	191.129	2.540	8.065	30.478	30.055	289.986
13	02/07/2000	143700	191.049	2.347	8.066	30.317	30.057	292.416
14	02/07/2000	143800	190.796	2.388	8.073	30.398	30.057	291.355
15	02/07/2000	143900	191.313	2.278	8.092	30.333	30.058	290.176
16	02/07/2000	144000	190.964	2.397	8.111	30.663	30.057	290.273
17	02/07/2000	144100	191.321	2.406	8.101	30.366	30.057	290.271
18	02/07/2000	144200	191.156	2.272	8.163	30.432	30.057	289.679
19	02/07/2000	144300	191.350	2.192	8.247	30.600	30.057	288.706
20	02/07/2000	144400	191.184	2.098	8.231	30.594	30.057	281.084
21	02/07/2000	144500	191.332	2.217	8.215	30.275	30.058	281.065
22	02/07/2000	144600	191.127	2.219	8.205	30.367	30.054	281.067
23	02/07/2000	144700	191.335	2.188	8.189	30.292	30.056	284.245
24	02/07/2000	144800	191.115	2.181	8.172	30.187	30.056	290.274
25	02/07/2000	144900	191.345	2.336	8.165	30.373	30.055	288.888
26	02/07/2000	145000	191.136	2.309	8.144	30.340	30.056	285.944
27	02/07/2000	145100	191.311	2.298	8.132	30.276	30.054	285.906
28	02/07/2000	145200	191.133	2.265	8.085	30.235	30.054	285.871
29	02/07/2000	145300	191.486	2.054	8.053	30.007	30.050	288.538
30	02/07/2000	145400	191.673	1.921	8.056	29.817	30.054	289.950
31	02/07/2000	145500	191.211	1.996	8.054	29.928	30.053	287.825
32	02/07/2000	145600	191.319	1.914	8.119	30.153	30.055	287.318
33	02/07/2000	145700	191.011	1.817	8.118	30.013	30.055	287.386
34	02/07/2000	145800	191.174	1.996	8.052	30.102	30.054	287.461
35	02/07/2000	145900	191.151	2.057	8.064	29.963	30.055	291.017
36	02/07/2000	150000	191.613	2.217	8.089	29.916	30.055	289.495
37	02/07/2000	150100	191.329	2.320	8.092	29.642	30.054	284.988
38	02/07/2000	150200	191.290	2.446	8.092	29.689	30.053	285.002
39	02/07/2000	150300	191.506	2.569	8.108	29.781	30.054	285.014
40	02/07/2000	150400	191.420	2.503	8.091	29.850	30.053	284.965
41	02/07/2000	150500	191.481	2.311	8.123	29.941	30.053	284.984
42	02/07/2000	150600	191.310	2.460	8.146	29.909	30.052	286.456
43	02/07/2000	150700	191.184	2.342	8.132	29.927	30.049	289.876
44	02/07/2000	150800	191.121	2.281	8.085	29.793	30.047	289.877
45	02/07/2000	150900	191.328	2.386	8.030	29.577	30.048	289.843
46	02/07/2000	151000	191.475	2.958	8.031	29.922	30.048	289.932
47	02/07/2000	151100	191.452	3.174	8.052	30.187	30.050	289.815
48	02/07/2000	151200	191.555	2.973	8.074	30.083	30.049	283.675
49	02/07/2000	151300	191.383	2.964	8.090	29.899	30.050	283.693
50	02/07/2000	151400	191.062	2.993	8.095	29.945	30.050	283.706
51	02/07/2000	151500	191.014	2.690	8.113	30.187	30.052	288.506
52	02/07/2000	151600	191.305	2.538	8.114	30.352	30.050	292.242
53	02/07/2000	151700	191.358	2.262	8.146	30.499	30.050	288.608
54	02/07/2000	151800	191.194	2.734	8.152	30.650	30.050	285.358
55	02/07/2000	151900	191.675	3.021	8.183	30.600	30.050	285.339
56	02/07/2000	152000	191.318	2.792	8.131	30.576	30.050	285.344
57	02/07/2000	152100	191.130	2.450	8.122	30.151	30.049	288.422
58	02/07/2000	152200	191.189	2.181	8.110	30.216	30.046	289.359

59	02/07/2000	152300	191.122	2.050	8.109	30.232	30.048	285.950
60	02/07/2000	152400	191.189	1.922	8.115	30.071	30.046	285.943
61	/ /							
62	/ /	AVE	191.243	2.380	8.095	30.153	30.053	288.099

Run 3

Record#	DATE	TIME	PC1GEN11	PC1OPA12	PC1CO213	PC1NOX14	PC1PRS15	PC1TMP16
1	02/07/2000	152900	191.145	2.104	8.125	29.977	30.045	285.758
2	02/07/2000	153000	191.124	2.151	8.123	29.977	30.046	285.756
3	02/07/2000	153100	191.343	2.088	8.160	30.218	30.048	285.781
4	02/07/2000	153200	191.148	2.144	8.173	30.268	30.048	288.075
5	02/07/2000	153300	191.586	2.213	8.190	30.601	30.048	289.234
6	02/07/2000	153400	190.944	1.979	8.182	30.268	30.049	282.439
7	02/07/2000	153500	191.363	1.736	8.152	30.106	30.047	281.350
8	02/07/2000	153600	191.139	1.771	8.147	30.157	30.047	281.308
9	02/07/2000	153700	191.352	1.820	8.139	29.960	30.044	285.749
10	02/07/2000	153800	191.140	1.786	8.097	29.706	30.046	292.817
11	02/07/2000	153900	191.101	1.823	8.120	29.525	30.042	288.491
12	02/07/2000	154000	191.131	1.947	8.051	29.184	30.043	283.980
13	02/07/2000	154100	191.119	2.119	8.029	28.944	30.045	283.998
14	02/07/2000	154200	191.313	2.115	8.046	28.825	30.044	284.009
15	02/07/2000	154300	191.347	2.235	8.069	28.676	30.042	290.995
16	02/07/2000	154400	191.168	2.330	8.125	28.909	30.045	290.552
17	02/07/2000	154500	191.308	2.222	8.178	29.454	30.044	287.999
18	02/07/2000	154600	191.531	2.073	8.226	29.917	30.043	288.019
19	02/07/2000	154700	191.076	2.168	8.194	29.698	30.043	287.954
20	02/07/2000	154800	191.226	2.109	8.168	29.603	30.040	289.435
21	02/07/2000	154900	191.371	2.034	8.100	29.414	30.038	290.683
22	02/07/2000	155000	191.050	2.107	8.035	28.940	30.039	288.549
23	02/07/2000	155100	191.072	2.460	8.058	28.633	30.037	287.704
24	02/07/2000	155200	191.158	2.606	8.035	28.374	30.039	287.671
25	02/07/2000	155300	191.149	2.580	8.076	28.863	30.040	290.940
26	02/07/2000	155400	191.409	2.641	8.069	28.706	30.040	293.782
27	02/07/2000	155500	191.175	2.760	8.096	28.984	30.042	277.958
28	02/07/2000	155600	191.048	2.877	8.138	29.087	30.041	277.522
29	02/07/2000	155700	191.146	2.938	8.130	29.365	30.041	277.513
30	02/07/2000	155800	191.236	2.856	8.112	29.277	30.041	286.125
31	02/07/2000	155900	191.348	2.738	8.137	29.460	30.042	292.316
32	02/07/2000	160000	191.440	2.615	8.186	29.246	30.041	284.109
33	02/07/2000	160100	191.461	2.590	8.157	29.172	30.040	280.318
34	02/07/2000	160200	191.262	3.202	8.134	28.943	30.043	280.299
35	02/07/2000	160300	191.122	2.609	8.155	28.786	30.041	280.263
36	02/07/2000	160400	191.199	2.449	8.133	28.834	30.042	280.266
37	02/07/2000	160500	191.362	2.761	8.108	28.892	30.040	280.262
38	02/07/2000	160600	191.127	2.457	8.149	29.231	30.041	280.638
39	02/07/2000	160700	190.920	2.545	8.135	29.239	30.042	281.103
40	02/07/2000	160800	191.285	2.772	8.151	29.081	30.043	281.182
41	02/07/2000	160900	191.141	2.339	8.153	29.071	30.039	281.190
42	02/07/2000	161000	191.080	2.931	8.101	29.049	30.037	289.831
43	02/07/2000	161100	191.042	2.730	8.110	28.878	30.038	290.485
44	02/07/2000	161200	191.354	2.935	8.106	28.883	30.039	290.508
45	02/07/2000	161300	191.335	2.885	8.118	28.980	30.041	290.489
46	02/07/2000	161400	191.344	2.909	8.160	28.958	30.043	290.510
47	02/07/2000	161500	191.343	3.015	8.199	29.086	30.044	290.507
48	02/07/2000	161600	191.303	2.481	8.203	29.302	30.044	290.526
49	02/07/2000	161700	191.123	2.242	8.262	29.057	30.042	290.273
50	02/07/2000	161800	191.073	2.662	8.226	29.182	30.038	290.019
51	02/07/2000	161900	190.690	3.367	8.144	28.709	30.038	290.016
52	02/07/2000	162000	190.943	3.446	8.149	28.922	30.039	289.845
53	02/07/2000	162100	191.356	3.402	8.158	28.978	30.040	288.510
54	02/07/2000	162200	191.774	3.346	8.181	29.031	30.040	284.344
55	02/07/2000	162300	191.369	3.346	8.175	29.100	30.039	280.639
56	02/07/2000	162400	191.387	3.180	8.135	29.117	30.042	280.666
57	02/07/2000	162500	191.382	3.228	8.143	29.091	30.038	280.635
58	02/07/2000	162600	191.374	3.302	8.060	28.797	30.037	291.256

59	02/07/2000	162700	191.160	3.334	7.997	28.387	30.043	292.001
60	02/07/2000	162800	191.536	3.347	8.031	28.246	30.043	291.999
61	/ /							
62	/ /	AVE	191.234	2.566	8.130	29.222	30.042	286.286

APPENDIX C

FIELD DATA SHEETS

APPENDIX C - 1 UNCORRECTED REFERENCE METHOD DATA SHEETS

APPENDIX C - 1

UNCORRECTED REFERENCE METHOD DATA SHEETS

POLK POWER STATION UNIT 1 O2 TRAVERSE   02-07-2000

TIME	CHAN 5 STACK %O2
12:42	11.83
12:43	11.84
12:44	11.84
12:45	11.82
12:46	11.81
12:47	11.82
12:48	11.83
12:49	11.83
12:50	11.84
12:51	11.84
12:52	11.84
12:53	11.83

AVERAGE VALUES FOR THE LAST 12 MINUTES

12:53   11.83

COMMENTS: END WEST PORT

POLK POWER STATION UNIT 1 O2 TRAVERSE 02-07-2000

TIME	CHAN 5 STACK %O2
12:24	11.85
12:25	11.85
12:26	11.85
12:27	11.87
12:28	11.84
12:29	11.83
12:30	11.82
12:31	11.83
12:32	11.83
12:33	11.83
12:34	11.84
12:35	11.83

AVERAGE VALUES FOR THE LAST 12 MINUTES
12:35 11.84

End South Port DAS

O2 Traverse DB

~~CONVERTER EFFICIENCY TEST~~ 02-07-2000

TIME	CHAN 5 STACK %O2
11:51	11.83
11:52	11.82
11:53	11.81
11:54	11.86
11:55	11.90
11:56	11.89
11:57	11.87
11:58	11.86
11:59	11.86
12:00	11.93
12:01	11.91
12:02	11.91

AVERAGE VALUES FOR THE LAST 12 MINUTES
12:02 11.87

COMMENTS: O2 TRAVERSE
EAST PORT

POLK POWER STATION UNIT 1 02 TRAVERSE 02-07-2000

TIME	CHAN 5 STACK %02
12:07	11.85
12:08	11.85
12:09	11.85
12:10	11.85
12:11	11.85
12:12	11.83
12:13	11.83
12:14	11.84
12:15	11.84
12:16	11.84
12:17	11.83
12:18	11.82

AVERAGE VALUES FOR THE LAST 12 MINUTES

12:18 11.84

COMMENTS: END NORTH PORT TRAVERSE

BEST AVAILABLE COPY

Test Run 1 STRATA Version 1.2.1

	O2 %	NOx ppm
Begin calculating run averages		
02-07-2000 13:20:59	12.017	28.97
02-07-2000 13:21:58	12.027	28.93
02-07-2000 13:22:59	12.019	29.02
02-07-2000 13:23:59	12.001	29.33
02-07-2000 13:24:58	11.982	29.45
02-07-2000 13:25:59	11.975	29.30
02-07-2000 13:26:59	11.982	29.24
02-07-2000 13:27:58	12.060	28.90
02-07-2000 13:28:59	12.040	28.90
02-07-2000 13:29:59	12.041	28.81
02-07-2000 13:30:58	12.040	28.97
02-07-2000 13:31:59	12.050	28.98
02-07-2000 13:32:58	12.042	29.00
02-07-2000 13:33:59	12.057	29.03
02-07-2000 13:34:59	12.053	29.09
02-07-2000 13:35:58	12.055	29.24
02-07-2000 13:36:59	12.054	29.26
02-07-2000 13:37:59	12.042	28.93
02-07-2000 13:38:58	12.023	29.00
02-07-2000 13:39:58	12.033	29.26
02-07-2000 13:40:59	12.040	29.44
02-07-2000 13:41:58	12.032	29.30
02-07-2000 13:42:59	12.035	29.41
02-07-2000 13:43:59	12.022	29.28
02-07-2000 13:44:58	12.020	29.18
02-07-2000 13:45:59	12.031	29.10
02-07-2000 13:46:59	12.016	29.16
02-07-2000 13:47:58	12.037	29.17
02-07-2000 13:48:59	12.036	29.46
02-07-2000 13:49:59	12.038	29.61
02-07-2000 13:50:58	12.043	29.72
02-07-2000 13:51:59	12.038	29.67
02-07-2000 13:52:59	12.046	29.49
02-07-2000 13:53:58	12.030	29.43
02-07-2000 13:54:59	12.020	29.15
02-07-2000 13:55:59	12.021	29.10
02-07-2000 13:56:58	12.019	29.31
02-07-2000 13:57:59	12.021	29.49
02-07-2000 13:58:58	12.032	29.70
02-07-2000 13:59:59	12.049	30.01
02-07-2000 14:00:59	12.041	29.83
02-07-2000 14:01:58	12.033	29.80
02-07-2000 14:02:59	12.036	29.77
02-07-2000 14:03:59	12.016	29.87
02-07-2000 14:04:59	12.013	29.65
02-07-2000 14:05:59	12.004	29.45
02-07-2000 14:06:59	12.007	29.71
02-07-2000 14:07:59	12.014	29.88
02-07-2000 14:08:58	12.009	29.99
02-07-2000 14:09:59	12.027	30.07
02-07-2000 14:10:59	12.015	29.87
02-07-2000 14:11:59	12.009	29.58

Test Run 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 14:12:58	12.006	29.60
02-07-2000 14:13:58	12.007	29.75
02-07-2000 14:14:59	12.011	29.81
02-07-2000 14:15:59	12.036	30.24
02-07-2000 14:16:59	12.041	30.28
02-07-2000 14:17:58	12.017	29.92
02-07-2000 14:18:59	12.006	29.80
02-07-2000 14:19:59	12.019	29.67
Run Averages	O2	NOx
	%	ppm
02-07-2000 14:19:59	12.026	29.44

Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG
Test Run 1 End

Test Run 2 STRATA Version 1.2.1

		O2 %	NOx ppm
Begin calculating run averages			
02-07-2000	14:25:01	9.217	19.48
02-07-2000	14:26:01	11.996	29.58
02-07-2000	14:27:01	11.998	29.81
02-07-2000	14:28:01	12.019	29.97
02-07-2000	14:29:01	12.017	30.24
02-07-2000	14:30:00	12.016	30.22
02-07-2000	14:31:01	12.016	30.20
02-07-2000	14:32:01	12.024	30.21
02-07-2000	14:33:01	12.054	30.20
02-07-2000	14:34:01	12.003	30.26
02-07-2000	14:35:01	12.008	30.29
02-07-2000	14:36:01	12.012	30.24
02-07-2000	14:37:01	12.022	30.28
02-07-2000	14:38:01	12.011	30.26
02-07-2000	14:39:01	12.007	30.46
02-07-2000	14:40:01	12.010	30.56
02-07-2000	14:41:01	12.000	30.39
02-07-2000	14:42:00	11.996	30.32
02-07-2000	14:43:01	12.000	30.36
02-07-2000	14:44:01	12.002	30.25
02-07-2000	14:45:01	11.998	30.32
02-07-2000	14:46:01	11.998	30.32
02-07-2000	14:47:01	12.007	30.47
02-07-2000	14:48:01	12.007	30.50
02-07-2000	14:49:01	12.006	30.59
02-07-2000	14:50:01	12.008	30.58
02-07-2000	14:51:01	12.008	30.61
02-07-2000	14:52:01	12.004	30.61
02-07-2000	14:53:01	12.008	30.62
02-07-2000	14:54:01	12.005	30.57
02-07-2000	14:55:01	12.002	30.59
02-07-2000	14:56:01	12.001	30.72
02-07-2000	14:57:01	12.004	30.68
02-07-2000	14:58:01	12.008	30.69
02-07-2000	14:59:01	12.005	30.82
02-07-2000	15:00:01	11.992	30.77
02-07-2000	15:01:01	11.993	30.69
02-07-2000	15:02:01	12.008	30.64
02-07-2000	15:03:01	11.999	30.78
02-07-2000	15:04:01	11.996	30.86
02-07-2000	15:05:01	11.985	30.79
02-07-2000	15:06:01	11.986	30.78
02-07-2000	15:07:00	11.988	31.16
02-07-2000	15:08:01	11.993	31.22
02-07-2000	15:09:01	11.999	31.41
02-07-2000	15:10:01	12.000	31.32
02-07-2000	15:11:01	11.987	31.07
02-07-2000	15:12:01	11.985	30.97
02-07-2000	15:13:01	11.984	31.24
02-07-2000	15:14:01	11.998	31.40
02-07-2000	15:15:01	11.992	31.46
02-07-2000	15:16:01	11.990	31.71

Test Run 2 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 15:17:01	11.998	31.72
02-07-2000 15:18:01	11.998	31.86
02-07-2000 15:19:01	12.002	31.83
02-07-2000 15:20:01	11.997	31.72
02-07-2000 15:21:01	12.001	31.81
02-07-2000 15:22:01	12.000	31.77
02-07-2000 15:23:01	11.991	31.66
02-07-2000 15:24:01	12.259	29.86
Run Averages	O2	NOx
	%	ppm
02-07-2000 15:24:01	11.961	30.55

Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG
Test Run 2 End

Test Run 3 STRATA Version 1.2.1

	O2 %	NOx ppm
Begin calculating run averages		
02-07-2000 15:29:01	14.472	17.79
02-07-2000 15:30:01	11.990	31.41
02-07-2000 15:31:01	11.981	31.51
02-07-2000 15:32:02	11.979	31.45
02-07-2000 15:33:02	11.971	31.35
02-07-2000 15:34:01	11.968	31.38
02-07-2000 15:35:01	11.970	31.44
02-07-2000 15:36:01	11.973	31.41
02-07-2000 15:37:01	11.983	31.38
02-07-2000 15:38:01	11.980	31.29
02-07-2000 15:39:01	11.968	31.04
02-07-2000 15:40:01	11.961	30.96
02-07-2000 15:41:01	11.957	30.86
02-07-2000 15:42:02	11.949	30.66
02-07-2000 15:43:01	11.967	30.80
02-07-2000 15:44:01	11.962	31.15
02-07-2000 15:45:02	11.964	31.20
02-07-2000 15:46:01	11.966	31.13
02-07-2000 15:47:01	11.961	31.20
02-07-2000 15:48:01	11.967	31.17
02-07-2000 15:49:02	11.967	30.82
02-07-2000 15:50:01	11.939	30.45
02-07-2000 15:51:01	11.934	30.59
02-07-2000 15:52:01	11.950	30.75
02-07-2000 15:53:02	11.957	30.72
02-07-2000 15:54:01	11.958	30.68
02-07-2000 15:55:01	11.973	30.89
02-07-2000 15:56:02	11.984	30.74
02-07-2000 15:57:02	11.968	30.76
02-07-2000 15:58:01	11.963	30.41
02-07-2000 15:59:01	11.960	30.16
02-07-2000 16:00:01	11.947	29.87
02-07-2000 16:01:01	11.944	29.63
02-07-2000 16:02:01	11.959	29.45
02-07-2000 16:03:02	11.972	29.44
02-07-2000 16:04:01	11.950	29.54
02-07-2000 16:05:01	11.957	29.35
02-07-2000 16:06:01	11.944	29.10
02-07-2000 16:07:02	11.948	28.82
02-07-2000 16:08:01	12.005	28.61
02-07-2000 16:09:01	12.017	28.59
02-07-2000 16:10:02	12.021	28.30
02-07-2000 16:11:01	12.026	28.15
02-07-2000 16:12:01	12.018	27.99
02-07-2000 16:13:01	12.010	27.75
02-07-2000 16:14:01	12.005	27.67
02-07-2000 16:15:01	11.998	27.37
02-07-2000 16:16:01	11.997	27.21
02-07-2000 16:17:01	12.002	27.21
02-07-2000 16:18:02	12.009	27.08
02-07-2000 16:19:01	12.005	27.17
02-07-2000 16:20:01	12.008	27.09

Test Run 3 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 16:21:01	12.001	26.95
02-07-2000 16:22:01	11.998	26.98
02-07-2000 16:23:01	11.991	26.94
02-07-2000 16:24:01	11.986	26.90
02-07-2000 16:25:01	11.996	27.00
02-07-2000 16:26:02	11.992	26.85
02-07-2000 16:27:01	11.992	26.84
02-07-2000 16:28:01	12.101	23.64
Run Averages	O2	NOx
	%	ppm
02-07-2000 16:28:01	12.019	29.26

Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG
Test Run 3 End

APPENDIX D

SAMPLING EQUIPMENT CALIBRATIONS

APPENDIX D-1

LINEARITY CALIBRATIONS

Calibration Error Test, Run 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 11:24:59	18.134	9.17
02-07-2000 11:25:59	22.653	0.96
02-07-2000 11:26:59	23.106	0.74
02-07-2000 11:27:59	17.601	0.74
02-07-2000 11:28:59	12.392	0.74
02-07-2000 11:29:59	12.185	0.76
02-07-2000 11:30:59	5.599	43.84
02-07-2000 11:31:59	0.470	71.25
02-07-2000 11:32:59	0.407	87.29
02-07-2000 11:33:59	0.374	81.64
02-07-2000 11:34:59	0.360	56.35
02-07-2000 11:35:59	0.354	47.24
02-07-2000 11:36:59	0.358	25.74
02-07-2000 11:38:17	0.350	25.67

Calibration Error Test at Run 1
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Low-range	Mid-range	High-range
O2	ALM017445		ALM020393	AAL15873
NOx		ALM0245301	ALM017813	ALM019127

Date/Time	02-07-2000		11:38:19	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Avg	0.374	0.74		
Zero Error%	1.5%	0.7%		
Low Ref Cyl		24.00		
Low Avg		25.68		
Low Error%		1.7%		
Mid Ref Cyl	11.960	48.56		
Mid Avg	12.187	49.35		
Mid Error%	0.9%	0.8%		
High Ref Cyl	23.100	81.13		
High Avg	23.078	81.12		
High Error%	0.1%	0.0%		

Calibration Error Test End

APPENDIX D-2

DRIFT ASSESSMENT CALS

Initial System Bias Check, Run 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 12:56:15	15.656	7.19
02-07-2000 12:57:15	12.042	3.60
02-07-2000 12:58:15	12.041	2.28
02-07-2000 12:59:15	2.069	22.98

Initial System Bias Check for Run 1

Operator: DAVID SMITH

Plant Name: POLK POWER STATION

Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Span
O2	ALM017445	ALM020393
NOx		ALM0245301

Date/Time 02-07-2000 12:59:59 PASSED

Analyte	O2	NOx
Units	%	ppm
Zero Ref Cyl	0.000	0.00
Zero Cal	0.374	0.74
Zero Avg	0.507	2.66
Zero Bias%	0.5%	1.9%
Zero Drift%		
Span Ref Cyl	11.960	24.00
Span Cal	12.187	25.68
Span Avg	12.040	25.41
Span Bias%	0.6%	0.3%
Span Drift%		

System Bias Check End

Initial System Bias Check, Run 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 11:39:49	4.979	14.90
02-07-2000 11:40:49	11.775	2.02
02-07-2000 11:41:49	10.100	5.66
02-07-2000 11:43:19	0.128	24.58

Initial System Bias Check for Run 1
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

	Reference Cylinder Numbers	
	Zero	Span
O2	ALM017445	ALM020393
NOx		ALM0245301

Date/Time 02-07-2000 11:43:20 PASSED

Analyte	O2	NOx
Units	%	ppm
Zero Ref Cyl	0.000	0.00
Zero Cal	0.374	0.74
Zero Avg	0.173	1.24
Zero Bias%	0.8%	0.5%
Zero Drift%		
Span Ref Cyl	11.960	24.00
Span Cal	12.187	25.68
Span Avg	11.805	24.56
Span Bias%	1.5%	1.1%
Span Drift%		

System Bias Check End

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

RUN NUMBER: 1

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	INITIAL VALUES			FINAL VALUES		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	2.7	1.92	1.5	0.76	-1.16
NOx UP-SCALE	25.7	25.7	0.00	24.1	-1.60	-1.60
O2 LOW GAS	0.37	0.51	0.53	0.69	1.26	0.73
O2 UP-SCALE	12.19	12.04	-0.59	12.21	0.08	0.67

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

RUN NUMBER: 1

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.51	0.51	0.00	0.69	0.72	0.72
O2 UP-SCALE	12.04	12.04	0.00	12.21	0.67	0.67

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

Final System Bias Check, Run 1 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 14:21:00	12.462	17.25
02-07-2000 14:22:00	12.164	1.42
02-07-2000 14:23:00	4.510	17.33

Final System Bias Check for Run 1
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Span
O2	ALM017445	ALM020393
NOx		ALM0245301

Date/Time 02-07-2000 14:23:55 PASSED

Analyte	O2	NOx
Units	%	ppm
Zero Ref Cyl	0.000	0.00
Zero Cal	0.374	0.74
Zero Avg	0.689	1.50
Zero Bias%	1.3%	0.8%
Zero Drift%	0.7%	-1.2%
Span Ref Cyl	11.960	24.00
Span Cal	12.187	25.68
Span Avg	12.208	24.08
Span Bias%	0.1%	1.6%
Span Drift%	0.7%	-1.3%
Ini Zero Avg	0.507	2.66
Ini Span Avg	12.040	25.41
Run Avg	12.026	29.44
Co	0.598	2.08
Cm	12.124	24.75
Correct Avg	11.858	28.97

System Bias Check End

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

RUN NUMBER: 2

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	1.5	0.76	3.4	2.63	1.87
NOx UP-SCALE	25.7	24.1	-1.60	25.9	0.22	1.82
O2 LOW GAS	0.37	0.69	1.26	0.66	1.12	-0.14
O2 UP-SCALE	12.19	12.21	0.08	12.15	-0.15	-0.23

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

RUN NUMBER: 2

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.51	0.69	0.72	0.66	0.58	-0.14
O2 UP-SCALE	12.04	12.21	0.67	12.15	0.44	-0.23

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

Final System Bias Check, Run 2   STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 15:25:03	11.483	5.39
02-07-2000 15:26:02	10.994	6.32
02-07-2000 15:27:31	0.419	26.22

Final System Bias Check for Run 2
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

	Reference Cylinder Numbers	
	Zero	Span
O2	ALM017445	ALM020393
NOx		ALM0245301

Date/Time	02-07-2000		15:27:31	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Cal	0.374	0.74		
Zero Avg	0.655	3.37		
Zero Bias%	1.1%	2.6%		
Zero Drift%	-0.1%	1.9%		
Span Ref Cyl	11.960	24.00		
Span Cal	12.187	25.68		
Span Avg	12.150	25.90		
Span Bias%	0.1%	0.2%		
Span Drift%	-0.2%	1.8%		
Ini Zero Avg	0.689	1.50		
Ini Span Avg	12.208	24.08		
Run Avg	11.961	30.55		
Co	0.672	2.43		
Cm	12.179	24.99		
Correct Avg	11.733	29.91		

System Bias Check End

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

RUN NUMBER: 3

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	INITIAL VALUES			FINAL VALUES		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	3.4	2.63	0.5	-0.23	-2.86
NOx UP-SCALE	25.7	25.9	0.22	23.0	-2.68	-2.90
O2 LOW GAS	0.37	0.66	1.12	0.40	0.09	-1.03
O2 UP-SCALE	12.19	12.15	-0.15	12.24	0.20	0.34

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 2/7/00

RUN NUMBER: 3

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.51	0.66	0.58	0.40	-0.45	-1.03
O2 UP-SCALE	12.04	12.15	0.44	12.24	0.78	0.34

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

Final System Bias Check, Run 3 STRATA Version 1.2.1

	O2	NOx
	%	ppm
02-07-2000 16:29:02	12.146	-0.27
02-07-2000 16:30:02	4.365	15.85
02-07-2000 16:31:02	0.419	22.28
02-07-2000 16:32:02	0.397	23.03

Final System Bias Check for Run 3
Operator: DAVID SMITH
Plant Name: POLK POWER STATION
Location: UNIT 1 HRSG

Reference Cylinder Numbers

	Zero	Span
O2	ALM017445	ALM020393
NOx		ALM0245301

Date/Time	02-07-2000		16:32:43	PASSED
Analyte	O2	NOx		
Units	%	ppm		
Zero Ref Cyl	0.000	0.00		
Zero Cal	0.374	0.74		
Zero Avg	0.397	0.51		
Zero Bias%	0.1%	0.2%		
Zero Drift%	-1.0%	-2.9%		
Span Ref Cyl	11.960	24.00		
Span Cal	12.187	25.68		
Span Avg	12.236	23.00		
Span Bias%	0.2%	2.7%		
Span Drift%	0.3%	-2.9%		
Ini Zero Avg	0.655	3.37		
Ini Span Avg	12.150	25.90		
Run Avg	12.019	29.26		
Co	0.526	1.94		
Cm	12.193	24.45		
Correct Avg	11.782	29.13		

System Bias Check End

APPENDIX D-3

CYLINDER GAS CERTIFICATION

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N31923
Project No.: 12-33126-001

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM020393 **Certification Date:** 3/11/99 **Exp. Date:** 3/11/2002
Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	11.96 %	+/- 1%	NIST
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658	1/02/01	ALM031884	9.680 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/16804-02	02/22/99	GC / TCD

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis **Second Triad Analysis** **Calibration Curve**

OXYGEN

First Triad Analysis		
Date: 03/11/99	Response Unit: AREA	
Z1=0.0000	R1=247696	T1=306452
R2=248148	Z2=0.0000	T2=306564
Z3=0.0000	T3=306567	R3=248251
Avg. Concentration:	11.96	%

Calibration Curve	
Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.99999	
Constants:	A=0.00
B=1.00	C=0.00
D=0.00	E=0.00

Special Notes:

APPROVED BY: B. M. Becton
B.M. BECTON

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704

Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory		Customer
	P.O. No.: EN31293	TAMPA ELECTRIC CO
SCOTT SPECIALTY GASES	Project No.: 12-32820-001	RAY MCDARBY
1750 EAST CLUB BLVD		5010 CAUSEWAY BLVD
DURHAM,NC 27704		TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: AAL15873 **Certification Date:** 2/23/99 **Exp. Date:** 2/22/2002

Cylinder Pressure*:** 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	23.1 %	+/- 2%	NIST
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2659	1/02/01	ALM031720	20.72 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/16804-O2	02/22/99	GC / TCD

Dil #2

Special Notes:

APPROVED BY: B. M. Becton

B.M. BECTON

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: E-N31293
Project No.: 12-32332-014

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM045301 Certification Date: 2/08/99 Exp. Date: 2/07/2001
Cylinder Pressure***: 1940 PSIG

COMPONENT	CERTIFIED CONCENTRATION		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	24.0	PPM	+/- 1%	NIST
NITROGEN - OXYGEN FREE		BALANCE		
NOX	24.9	BALANCE		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	4/09/99	ALM067006	21.48 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/CLA53A/850658093	02/08/99	CHEMILUMINESCENT

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date: 02/01/99	Response Unit: PPM	
Z1=0.0500	R1=21.580	T1=24.100
R2=21.510	Z2=0.0300	T2=23.990
Z3=0.0300	T3=24.010	R3=21.520
Avg. Concentration:	23.97	PPM

Second Triad Analysis

Date: 02/08/99	Response Unit: PPM	
Z1=0.1900	R1=21.400	T1=24.050
R2=21.410	Z2=0.1600	T2=24.040
Z3=0.1600	T3=24.010	R3=21.410
Avg. Concentration:	24.09	PPM

Calibration Curve

Concentration = A + Bx + Cx2 + Dx3 + Ex4
r = 0.999990

Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

Special Notes:

APPROVED BY: Greg T Bartlett
G BARTNETT

RATA CLASS

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N75516
Project No.: 12-36341-002

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM017813 Certification Date: 10/29/99 Exp. Date: 10/28/2001
Cylinder Pressure***: 1912 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	48.56	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	49.47	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	10/22/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date:10/22/99	Response Unit:PPM	
Z1=-0.01310	R1=48.79556	T1=48.39187
R2=48.89616	Z2=0.16660	T2=48.61919
Z3=0.08300	T3=48.62870	R3=49.00827
Avg. Concentration:	48.55	PPM

Second Triad Analysis

Date: 10/29/99	Response Unit: PPM	
Z1=0.14850	R1=49.06593	T1=48.55658
R2=48.76309	Z2=0.12020	T2=48.59997
Z3=0.04920	T3=48.54071	R3=48.87097
Avg. Concentration:	48.57	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

APPROVED BY: BMB
B.M. Becton

RATA CLASS CES-HARD-3

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD,DURHAM,NC 27704   Phone: 919-220-0803   Fax: 919-220-0808

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N31923
Project No.: 12-35046-001

Customer

TAMPA ELECTRIC CO

5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM019127   Certification Date: 7/19/99   Exp. Date: 7/18/2001
Cylinder Pressure***: 1994 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	81.13	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	81.82	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	07/15/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date:07/12/99	Response Unit:PPM	
Z1=0.1222	R1=48.911	T1=80.909
R2=48.792	Z2=-0.077	T2=81.157
Z3=0.1565	T3=81.343	R3=48.996
Avg. Concentration:	81.14	PPM

Second Triad Analysis

Date: 07/19/99	Response Unit: PPM	
Z1=0.2335	R1=48.805	T1=81.051
R2=48.938	Z2=-0.005	T2=81.173
Z3=0.1145	T3=81.120	R3=48.957
Avg. Concentration:	81.11	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

APPROVED BY: B.M. Becton

Scott Specialty Gases

Shipped From: 6141 EASTON ROAD PLUMSTEADVILLE PA 18949-0310
PO BOX 310
Phone: 215-766-8861
Fax: 215-766-2070

C E R T I F I C A T E O F A N A L Y S I S

TAMPA ELECTRIC CO

5010 CAUSEWAY BLVD

TAMPA FL 33619

PROJECT #: 01-06886-003
PO#: N31923
ITEM #: 0101818 AL
DATE: 8/04/98

CYLINDER #: ALM017445
FILL PRESSURE: 2000 PSIG

PURE MATERIAL: NITROGEN

CAS# 7727-37-9

GRADE: V O C FREE

PURITY: 99.999%

IMPURITY	MAXIMUM CONCENTRATIONS
THC	0.05 PPM
CO	0.10 PPM
CO2	0.3 PPM
H2O	2 PPM
O2	2 PPM

ANALYST: COLIN MCCARTY

QC BATCH : S06532

APPENDIX D-4

CONVERTER EFFICIENCY RESULTS

CONVERTER EFFICIENCY TEST 02-07-2000

	CHAN 3
	STACK
TIME	ppmNOX
10:39	26.1
10:40	26.1
10:41	26.1
10:42	26.1
10:43	26.1
10:44	26.1
10:45	26.1
10:46	26.1
10:47	26.1
10:48	26.1
10:49	26.0
10:50	26.0
10:51	26.0
10:52	26.0
10:53	26.0
10:54	26.0
10:55	25.9
10:56	26.0
10:57	25.9
10:58	25.9
10:59	25.9
11:00	25.9
11:01	25.9
11:02	25.9
11:03	25.8
11:04	25.8
11:05	25.9
11:06	25.8
11:07	25.8
11:08	25.8

AVERAGE VALUES FOR THE LAST 30 MINUTES

11:08 26.0

COMMENTS: END TEST

APPENDIX E

PROJECT PARTICIPANTS

TEST PARTICIPANTS

Corporate Environmental Services

Craig Coronado	Technician
David Smith	Senior Environmental Technician

Polk Power Station

David Knapp	Environmental and Safety Engineer

Best Available Copy

ENVIRONMENTAL PROTECTION COMMISSION HILLSBOROUGH COUNTY

ADMINISTRATIVE OFFICES, LEGAL & WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960
FAX (813) 272-5157

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

WETLANDS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

MEMORANDUM

DATE: February 15, 2000

TO: Mr. Clair Fancy
Florida Department of Environmental Protection
Bureau of Air Regulations

FROM: Rob Kalch RSK **Thru:** Richard C. Kirby IV, P.E. SP for

SUBJECT: **Tampa Electric Company, Polk Power Station, Title V Permit BACT Determination for Syngas Combustion Turbine-Test #2**

PSD-FL-194e

Although TEC, Polk Power Station is not located within Hillsborough County, due to the proximity of this facility, the Environmental Protection Commission of Hillsborough County wishes to thank you for the opportunity to review and comment on this report.

The NO_x BACT determination test results for TEC, Polk Power Station received November 15, 1999, and January 13, 2000 have been reviewed and compared to determine what changes, if any, have occurred in the NO_x emissions from the facility. The facility uses syngas, and this analysis is based on the assumption there was no change in the syngas, between October and December 1999.

The raw test data (ppm NO_x) was adjusted to 15 percent oxygen and corrected to account for instrument calibration using equations 6C-1 and 3A-1 (40 CFR 60, Appendix A). The test data was condensed by the facility and is presented in table 1. The corrected average NO_x concentrations are shown in table 2. Equation 19-1 and table 19-1, (Appendix A, 40 CFR 60), were used to calculate the emissions from the facility on a lbs/MMBtu basis.

$$E = C_d F_d \times \left[\frac{20.9}{(20.9 - 15.0)} \right] \qquad \text{Eq. 19-1}$$

In the absence of an appropriate F_d value for calculating an emission factor using equation 19-1, an average value of 8710 dscf/MMBtu was used. This value is listed in table 19-1, 40 CFR 60, Appendix A, for gaseous fuels. All other parameters reported were very consistent, and the calibration curves produced by the analytical equipment indicate proper calibration (table 7 and charts 1 and 2). The emissions were converted to a lbs/hour basis by using the values listed in table 3. The resulting emissions from the facility are shown in table 4. Finally, normalizing the energy consumed per MW produced suggests the plant was operating less efficiently during the December test (Table 6).

Although the concentration of NO_x was reduced, the total mass of NO_x emissions from the facility has increased over the last quarter. The major contributors to higher emissions are; a slight increase in syngas consumption and a significantly higher heating value associated with the syngas used in December. Considering the gas consumption is on a per second basis a small change will result in a substantially higher value for the energy consumed per unit of time. Since the emission factor calculated using Method 19 has units of lbs/MMBtu, the increase in total mass of NO_x emitted is directly proportional to both the consumption and the heating value of the syngas.

This analysis was based on the assumption there was no change in the syngas between October and December, but it is obvious there was a significant difference in the heating capacity of the syngas used. I have requested an explanation for the difference in the lower heating values for the syngas, and have not received any response yet. Without the correct F_d values for the syngas used, a valid evaluation of the emissions from the facility cannot be completed. One way to calculate an appropriate F_d value is with an absolute chemical analysis of the syngas using section 3.2.1, eq. 19-13, Appendix A, but would only be valid if it were performed on a sample of syngas used during the testing period. A value generated from a sample today would have the same flaw as the value used in the above analysis; it would not account for the difference between the gas used in October and December.

The next test was scheduled for February 7, 2000.

Best Available Copy

rsk

TECO
Polk Power Station

	October			December		
Test Run	#1	#2	#3	#1	#2	#3
NO_x (ppm)	26	26	26	23	24	22
NO_x (ppm) *	16.7	16.7	16.7	14.6	15.1	14.0
% O_2 **	11.7	11.7	11.7	11.6	11.5	11.6

Table 1. Condenced data from BACT determination test reports.

	October	December
NO_x (ppm) *	16.7	14.5

Table 2. Average corrected concentrations of NOx emissions.

* The NO_x concentration has been corrected to 15% O_2 with equation 3A-1, pg 627 from 40 CFR 60.

** The %O_2 has been corrected with equation 6C-1, pg 721 from 40 CFR 60 to account for equipment calibration.

		October	December	
Lower Heating Value	Btu/lb	175	240.1	Given in report
Syngas Mass Flowrate	lb/sec	102.5	103.8	Given in report
MW Produced	MW/hr	191	190.0	Given in report (1PWRJI900)
F_d (assumed)	scf/MMBtu	8710	8710	Table 19-1 Meth 19, 40 CFR 60.
Conversion factor - (ppm to lb/scf)		1.19E-07	1.19E-07	Table, Method 19, 40 CFR 60.

Table 3. Values and conversion factors.

Emission rates (lb/hr).	
October	3.97
December	4.81

Table 4. Calculated emission rates.

Oct	0.021	lbs NO_x / MW produced
Dec	0.025	lbs NO_x / MW produced

Table 5. Emissions normalized to power produced.

Oct	0.34	MMBtu / MW produced
Dec	0.47	MMBtu / MW produced

Table 6. Energy consumption normalized to power produced.

Best Available Copy

	December				October			
	Stoichiometric		Analytical		Stoichiometric		Analytical	
	% O_2	NO_x (ppm)	% O_2	NO_x (ppm)	% O_2	NO_x (ppm)	% O_2	NO_x (ppm)
	0	0	-0.02	0.8	0	0	0.04	-0.3
	11.96	24	12.12	25.9	11.96	24	12.06	25.3
	23.1	48.6	23.16	50.5	23.1	48.5	23.18	50
		81.1		82.6		81.1		81.1

Table 7. Calibraton data.

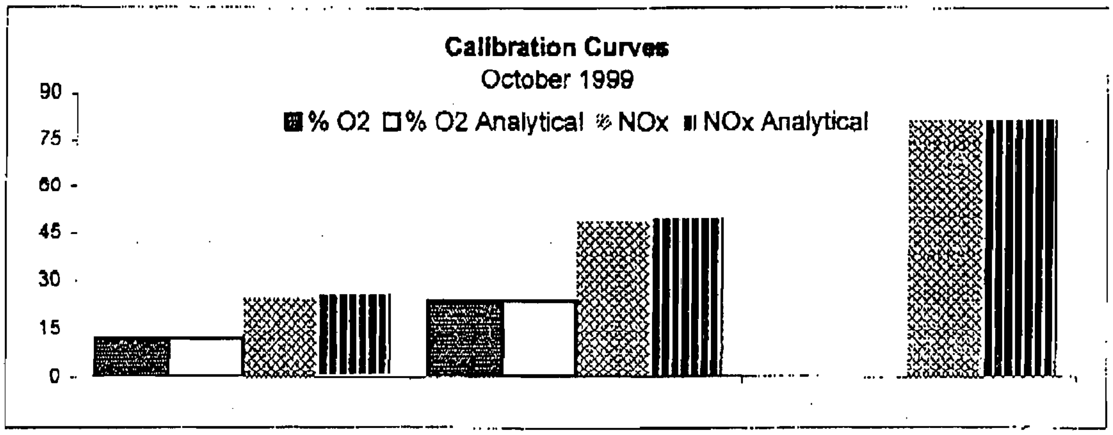

Chart 1. October calibration.

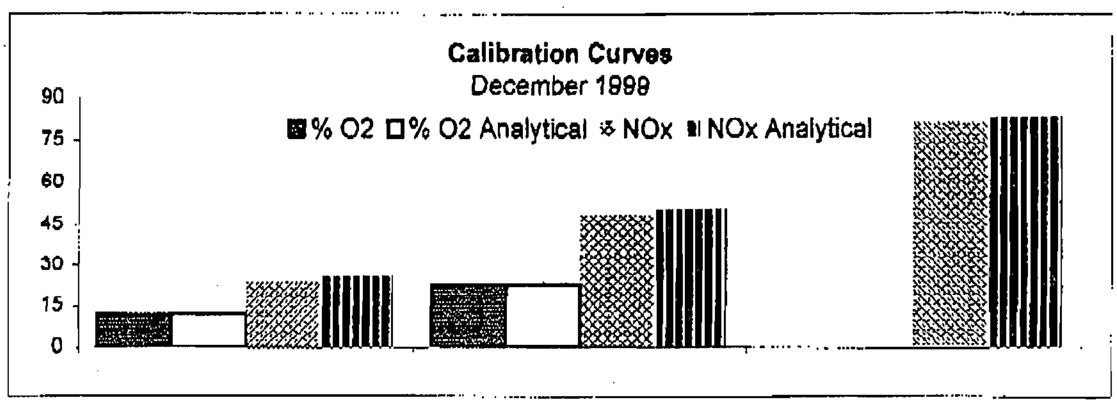

Chart 2. December calibration.

TECO

TAMPA ELECTRIC

RECEIVED

FEB 17 2000

BUREAU OF AIR REGULATION

February 11, 2000

Mr. Bill Proses
Florida Dept. Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via Facsimile and U.S. Mail

Re: Tampa Electric Company (TEC) - Polk Power Station (PPS) Unit No. 1
Petroleum Coke/Coal Performance Stack Test
Amendment to Notification of Postponement Letter
Faxed on February 10, 2000

PSD-FL-194C

Dear Mr. Proses:

Regarding my letter of February 9, 2000 which stated that PPS initially went offline on the morning of February 9, 2000, please be advised that PPS actually went offline at approximately 16:40 on February 8, 2000. I apologize for the inconvenience that this may have caused.

If you have any questions, please contact me at (813) 641-5034.

Sincerely,

Linda Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK112

c: Syed Arif, FDEP
Buck Oven, FDEP
Howard L. Rhodes, FDEP
Bill Thomas, FDEP SWD

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111

AN EQUAL OPPORTUNITY COMPANY
HTTP://WWW.TAMPAELECTRIC.COM

(813) 228-4111

CUSTOMER SERVICE:
HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

TECO

TAMPA ELECTRIC

February 11, 2000

Mr. Bill Proses
Florida Dept. Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via Facsimile and U.S. Mail

Re: Tampa Electric Company (TEC) - Polk Power Station Unit No. 1
Petroleum Coke/Coal Performance Stack Test
Notification of Rescheduling

PSD-FL-194C

Dear Mr. Proses:

This letter is to notify you that the above referenced stack test has been rescheduled for February 14-15, 2000. If there are any other changes in regard to the stack test, TEC will continue to notify you. If you have any questions, please contact me at (813) 641-5034.

Sincerely,

Linda Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK111

c: Syed Arif, FDEP
Buck Oven, FDEP
Howard L. Rhodes, FDEP
Bill Thomas, FDEP SWD

TECO
TAMPA ELECTRIC

RECEIVED
FEB 14 2000
BUREAU OF AIR REGULATION

February 9, 2000

Mr. Bill Proses
Dept Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619

Via Facsimile and U.S. Mail

Re: Tampa Electric Company (TEC) - Polk Power Station Unit No. 1
Petroleum Coke/Coal Performance Stack Test
Notification of Postponement

PSD-FL-194C

Dear Mr. Proses:

This letter is to notify you that the above referenced stack test scheduled for February 10, 1999 has been postponed until further notice. An update from Polk Power Station (PPS) personnel indicates that the combustion turbine and the steam turbine had "tripped" on the morning of February 9, 2000, and further assessment determined the breaker to the steam turbine was damaged. At this time, it is uncertain when PPS will come online. In addition, PPS is scheduled for a two-week outage starting on February 26, 2000. Thus, it is possible that the outage may be moved up due to the current mechanical failure. In that case, we would request an extension to commence our petcoke/coal blend syngas performance test after March 1, 2000. (Please refer to Permit No. 1050233-002-AC, PSD-FL-194C, Condition No.2).

In the meantime, TEC will continue to update you on the status of the above referenced test. If you have any questions, please contact me at (813) 641-5034.

Sincerely,

Linda M. Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK110

c: Syed Arif, FDEP
Buck Oven, FDEP
Howard L. Rhodes, FDEP
Bill Thomas, FDEP SWD

TAMPA ELECTRIC

RECEIVED
JAN 31 2000
BUREAU OF AIR REGULATION

January 25, 2000

Mr. Clair Fancy
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via Fed Ex
Airbill No. 7922 9787 1963

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine Third Test Courtesy Notification

PSD- FI -194(C)

Dear Mr. Fancy:

With respect to the Polk Power Station NO_x BACT Determination testing, this letter serves to notify the Department that the next scheduled NO_x BACT test on the combustion turbine will take place on February 7, 1999. This is subject to change based on operating conditions, equipment availability, and manpower availability. If you have any questions, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\SKT139

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Charles A Shelnut, GM
Tampa Electric Co
PO BOX 775
Tampa, Fl
33680-0775

4a. Article Number
Z 031 391 902

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

7. Date of Delivery DEC 17 1999

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

PS Form **3811,** December 1994 102595-98-B-0229 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 031 391 902

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

Sent to	Charles Shelnutt
Street & Number	1 ECO
Post Office, State, & ZIP Code	TAMPA Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	PSD-Fl-194 12-14-99 1050233-002-AC

PS Form **3800**, April 1995

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

December 13, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles A. Shelnut
General Manager
Tampa Electric Company
P.O. Box 775
Tampa, Florida 33680-0775

Dear Mr. Shelnut:

Re: Modification of PSD-FL-194
Tampa Electric Polk Power Station, Unit No. 1
Petroleum Coke/Coal Performance Test Request

The Department has reviewed the request from Tampa Electric Company (TEC) dated May 21, 1998 and supplementary information dated September 8, 1998 and November 10, 1998 to conduct performance tests while firing synthetic natural gas (syngas) produced from petroleum coke/coal blends at Polk Power Station, Unit No. 1.

You are hereby authorized to conduct performance tests for pollutant emissions on Polk Power Station Unit No. 1 in Polk County while firing syngas produced from blends of petroleum coke (petcoke) and bituminous coal (coal). All Conditions of Certification and Conditions of Approval in your Site Certification and PSD Permit related to air pollution emission limits and control equipment remain in force.

The performance tests will be conducted in order to gather data regarding pollutant emissions and operational limitations while firing syngas produced from blends of petcoke and coal. The blends can contain a maximum of 70 percent (% by weight) petcoke. Screening to determine whether future long-term firing of syngas produced from blends of petcoke and coal blends syngas constitutes a modification subject to a review for Prevention of Significant Deterioration (PSD) shall be performed in accordance with Chapter 403, F.S.; Chapters 62-210 through 62-297 and 62-4, F.A.C.; and, Title 40, Code of Federal Regulations (CFR; July 1, 1998 version). The procedure will consist of a comparison of estimates of "representative actual annual emissions" while burning petcoke/coal blends syngas against past actual emissions while burning coal syngas (or estimates of past actual emissions developed from 100 percent coal syngas baseline performance tests).

The performance test results along with any modification application to allow permanent firing of syngas produced from blends of petcoke/coal will be reviewed by the Department's Bureau of Air Regulation (BAR) and interested agencies (i.e., DEP Southwest District office, U.S. EPA, U.S. Fish and Wildlife Service, National Park Service, etc.).

The performance tests shall be subject to the following conditions:

1. The permittee shall notify, in writing, the Department's BAR office, the Southwest District office, and the Site Certification office at least 15 days prior to commencement of the baseline and the petcoke/coal blend syngas performance tests. A written test result report shall be submitted to these offices within 45 days upon completion of the last test run.

2. The petcoke/coal blend syngas performance tests shall commence on or before March 1, 2000 and be conducted for not more than 90 days. The tests shall be conducted based on the proposed testing protocol to establish steady state operation and to achieve a maximum (70%) blend. If, for any reasons, a steady state operation of 70% petroleum coke/coal blend syngas, or less, is not achieved, or the testing at 70% petcoke blend syngas or less, presents any operational or environmental concerns, the testing shall be curtailed. The Department shall be immediately notified of the problems that have prevented steady state operations and what steps will be initiated to correct the problem. All testing shall be concluded within 150 days of when petcoke is first introduced into Unit No. 1.

   Estimated Date of Introduction of Fuel Blend Syngas: January 1, 2000
   (Note: This is the date at which a run on Petcoke fuel blend syngas may be commenced. It does not indicate that Unit 1 will run continuously from January 1 to June 1, 2000)

   Estimated Testing Schedule:

   Scenario: 55% Petcoke/ 45% Coal

   Estimated date to begin testing: March 1, 2000

   Scenario: 60% Petcoke/40% Coal (if 55% blend emissions are less than baseline)

   Estimated date to begin testing: April 1, 2000

   Scenario: 65% Petcoke/ 35% Coal (if 60% blend emissions are less than baseline)

   Estimated date to begin testing: May 1, 2000

   Scenario: 70% Petcoke/ 30% Coal (if 65% blend emissions are less than baseline)

   Estimated date to begin testing: May 15, 2000

3. Stack emissions from Unit No. 1 shall not exceed the following during baseline and petcoke/coal blend syngas performance tests (based on most stringent of present PSD Permit and Certification Conditions):

   a. Sulfur dioxide (SO_2) - 357 pounds per hour on a 30-day rolling average.

   b. Nitrogen oxides (NO_x) - 222.5 pounds per hour on a 30-day rolling average.

4. As-burned fuel samples shall be collected and analyzed for the sulfur and nitrogen content throughout the petroleum coke/coal blend syngas and the baseline coal syngas test periods.

5. The performance tests of the petcoke/coal blend syngas shall be limited to a maximum of 70% petcoke, by weight. The maximum weight of the petroleum coke burned during the petcoke/coal blend syngas performance tests shall not exceed 1628 tons per day, on a dry basis.

6. The maximum sulfur content of the fuel shall not exceed 3.5 percent, by weight, during the baseline tests and the petroleum coke/coal blend syngas tests.

7. SO_2, NO_x, and opacity emissions data shall be recorded using continuous emissions monitors (CEMS) during the baseline and the petcoke/coal blend syngas tests. If the plant CEMS are used for these tests, these systems shall be quality assured pursuant to 40 CFR 60, Appendix F requirements. The data assessment report per 40 CFR 60, Appendix F, for the most recent relative accuracy test audit (RATA) and most recent cylinder gas audit (CGA), shall be submitted with the test report. In addition, stack tests shall be conducted for sulfuric acid mist during the baseline and petcoke/coal blend syngas tests. A satisfactory performance test for each baseline test and each petroleum coke-coal blend syngas shall consist of a minimum of three tests at three runs per test.

8. The pollutant emission results from the petroleum coke/coal blend syngas performance tests shall be used to estimate "representative actual annual emissions" following an operational change per 62-210.200 (12)(d), F.A.C., for comparison with actual emissions per Rule 62-210.200(12)(a), F.A.C. The comparison will form the basis of a PSD applicability determination pursuant to 40 CFR 52.21. The results of baseline performance tests when firing coal syngas will be used only to the extent that such information does not already exist or is insufficient to determine actual emissions.

9. Performance tests shall be conducted using EPA Reference Methods, as contained in 40 CFR 60 (Standards of Performance for New Stationary Sources), or any other method approved by the Department, in writing, in accordance with Chapter 62-297, F.A.C.

10. If additional time is needed, the permittee shall request an extension of time and provide the Department with documentation of the progress accomplished to-date and shall identify the work required to complete the performance tests.

11. Daily records (e.g., heat input, MW, fuel input rates, etc.) of IGCC operations while firing the petcoke/coal blend syngas and while firing only coal syngas (baseline) during the tests shall be required.

12. The Southwest District office may conduct a Type I or II stack audit.

13. Complete documentation (recording) of any firing of the petroleum coke-coal blend syngas shall be required (i.e., all CEMs records; testing results; materials utilized, by weight; etc.) and kept on file for a minimum of five years.

14. The authorized petroleum coke/coal blend syngas performance tests shall not result in the release of objectionable odors pursuant to Rule 62-296.320(2), F.A.C.

15. Performance testing shall cease as soon as possible if Unit No. 1 operations are not in accordance with the conditions in the air section of Site Certification No. PA 92-32, PSD Permit No. PSD-FL-194, or this authorization protocol. Performance testing shall not resume until appropriate measures to correct the problem(s) have been implemented.

16. The performance tests for pollutant emissions shall be conducted under the direct supervision of a professional engineer registered in Florida.

17. This Department action is only to authorize the petroleum coke-coal blend syngas performance tests. Any firing of petroleum coke beyond the 90 days of testing within the 150 day period approved to conduct such tests will be deemed a violation of the Site Certification No. PA 92-32 and Permit No. PSD-FL-194.

18. The Southwest District office shall be immediately notified, in writing upon completion of the final test.

19. The testing series shall include emissions tests for each of the petroleum coke/coal blends syngas and pollutants with the source operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the capacity allowed by Site Certification PA 92-32 and Permit PSD-FL-194. If it is impracticable to test at permitted capacity, then the source may be tested at a lesser rate. However, the tests **shall** be conducted at capacities within 10 percent of each other and corrected to the same heat input basis. Furthermore, subsequent source operation with a petroleum coke-coal blend syngas, if requested and approved by the Department, shall be limited to 110 percent of the tested capacity for that blend syngas until new tests are conducted, which requires prior Department authorization.

20. Attachments to be incorporated:
    - Tampa Electric Company letters dated May 21, September 8 and November 10, 1998.
    - FDEP letters dated June 16 and October 5, 1998.

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order (permit modification) has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

Howard L. Rhodes
Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this permit modification was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 12-14-99 to the person(s) listed:

Charles A. Shelnut, TEC*
Buck Oven, DEP PPS
Bill Thomas, DEP SWD
Gregg Worley, EPA
John Bunyak, NPS
Patrick Shell, TEC

Clerk Stamp

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

Kari Jober 12-14-99
(Clerk) (Date)

FINAL DETERMINATION

Tampa Electric Company

Permit No. 1050233-002-AC, PSD-FL-194C

Polk Power Station, Unit No. 1

An Intent to Issue PSD Permit modification to Tampa Electric Company, to temporarily burn syngas made from blends of petroleum coke and coal in Unit 1, in Polk County, was distributed on November 4, 1999. The Notice of Intent was published in the Lakeland Ledger on November 17, 1999. Copies of the draft construction permit were available for public inspection at the Department offices in Tampa and Tallahassee.

No comments were submitted by the National Park Service or the public. Telephonic comments were received from the Environmental Protection Agency (EPA) asking for clarification in the modification letter. The clarification sought was to include the word syngas after petroleum coke/coal blends. This addition will provide reasonable assurance that the blend of petroleum coke/coal will have to be converted to syngas prior to firing. The Department agrees with EPA's request and will make the necessary changes to the modification letter.

The final action of the Department is to issue the PSD permit modification with the changes noted above.

Memorandum

Florida Department of Environmental Protection

BAR

RECEIVED

DEC 14 1999

BUREAU OF AIR REGULATION

TO: Howard L. Rhodes

THRU: Clair Fancy
Al Linero 12/10

FROM Syed Arif

DATE: December 9, 1999

SUBJECT: Tampa Electric Company, PSD-FL-194C

Attached for approval and signature is a PSD permit modification for Tampa Electric Company Integrated Gasification Combined Cycle Facility located in Mulberry, Florida. The modification will allow TEC to conduct a series of performance tests for pollutant emissions while firing syngas made from blends of petroleum coke (petcoke) and coal. The testing will be done on Unit 1. The Unit is required to meet its permitted emission limits during the tests and is also required to document any increases in actual emissions caused by burning syngas made from coal/petcoke blends. This documentation is required to determine if a permanent switch to coal/petcoke blend would require a PSD review.

Emissions of nitrogen oxides are controlled by the addition of nitrogen in the turbine combustion chamber which reduces the combustor flame temperature, thereby reducing the formation of NO_x in the fuel combustion process. Particulate matter is controlled by high efficiency cyclones. Emissions control for SO_2 consists of an acid gas removal unit.

The project modification provides reasonable assurance that all the requirements of the permit modification will be complied with.

Day 90 for the project is December 18, 1999.

I recommend your approval and signature.

that makes industrial strength sulfuric acid — so we expect (and require) no increase in SO_2.

TAMPA ELECTRIC

RECEIVED

JAN 18 2000

DIVISION OF AIR
RESOURCES MANAGEMENT

CLAIR

January 14, 2000

Mr. Howard L. Rhodes
Director
Bureau of Air Regulations
Dept Environmental Protection
Air Resources Management
Twin Towers Office Building
2600 Blair Stone Road, MS 5500
Tallahassee, FL 32399-2400

Via FedEx
Airbill No. 7925 3745 5410

Re: Tampa Electric Company (TEC) – Polk Power Station Unit No. 1
Baseline and Petroleum Coke/Coal Performance Tests
Notification of Testing Schedule
Permit No. 1050233-002-AC, PSD-FL-194

Dear Mr. Rhodes:

This letter is to advise you that at this time, TEC has tentatively scheduled the above referenced stack tests for the week of February 7, 2000. We would like to perform the baseline syngas performance test (100% coal) on February 7, followed by a 40% petcoke and 60% coal blend syngas performance test on February 10. Subsequent petcoke/coal blend syngas performance tests will be scheduled in accordance with the above referenced permit. TEC will notify the Department accordingly.

If you have any questions, please contact me at (813) 641-5034.

Sincerely,

Linda M. Kong

Linda M. Kong
Associate Engineer
Environmental Planning

EP\gm\LMK108

c: Syed Arif, FDEP
Buck Oven, FDEP
Bill Thomas, FDEP SWD

AL

TEC O

TAMPA ELECTRIC

RECEIVED
NOV 24 1999
BUREAU OF AIR REGULATION

November 22, 1999

Mr. Clair Fancy
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via Fed Ex
Airbill No. 7907 8879 1479

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine Second Test Courtesy Notification

1050233-002-AC
PSD-FI-194C

Dear Mr. Fancy:

With respect to the Polk Power Station NO_x BACT Determination testing, this letter serves to notify the Department that the next scheduled NOx BACT test on the combustion turbine will take place on Tuesday, December 7, 1999. This is subject to change based on operating conditions, equipment availability, and manpower availability. If you have any questions, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\SKT123

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

TAMPA ELECTRIC

RECEIVED
NOV 23 1999
BUREAU OF AIR REGULATION

November 22, 1999

Mr. A. A. Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7918 0911 0923

Re: Tampa Electric Company (TEC)
Polk Power Station
Petcoke Test Burn Authorization

Dear Mr. Linero:

I have enclosed the affidavit of publication for the public notice of Intent to Issue PSD Permit Modification. The public notice was printed in the November 17 issue of The Ledger. Thank you for your assistance in this matter. If you have any questions, please feel free to telephone me at (813) 641-5210.

Sincerely,

Patrick Shell
Engineer
Environmental Planning

EP\gm\PLS133

Enclosure

cc: SWD
Hillsboro Co
J. Arif
polk Co.

AFFIDAVIT OF PUBLICATION
THE LEDGER
Lakeland, Polk County, Florida

Case No ....

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared Nelson Kirkland, who on oath says that he is Classified Advertising Manager of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a

....

Pubic Notice of Intent to Issue PSD Permit Modification

....

DEP File NO. 1050233-002-AC

in the matter of...

....

....

in the...

....

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

11-17;1999

....

....

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed...
Nelson Kirkland
Classified Advertising Manager
Who is personally known to me.

Sworn to and subscribed before me this.......17TH..........

day of....NOVEMBER.... A.D. 19..99.........

Notary Public
DONALD RAY JENKINS

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

My Commission Expires...

BC740340 D327 G. Morales

Attach Notice Here

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP File No. 1050233-002-AC
PSD-FL-194C/PA 92-32
Polk Power Station Integrated Gasification Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Tampa Electric Company (TEC) to conduct a series of performance tests for pollutant emissions while firing syngas made from blends of petroleum coke (petcoke) and coal. The testing will be done on Unit 1 at its Integrated Gasification Combined Cycle Facility (Polk Power Station) located at 9895 State Road 37 South, Mulberry, Polk County. Testing will begin in January 2000 and be conducted over a period of five months. The applicant's name and address are: Tampa Electric Company, Post Office Box 775, Tampa, Florida 33680-0775.

Presently, the plant is only allowed to burn syngas made from coal gasification. Emissions control for SO_2 consists of an acid gas removal unit. Emissions control for NO_x consists of nitrogen diluent injection to the Combined Cycle Unit. The Unit must continue to meet its permitted emission limits during the tests and is required to document any increases in actual emissions caused by burning syngas made from blends of petroleum coke and coal. This documentation is required to determine if a permanent switch to coal/petcoke blend would require a review pursuant to Rule 62-212.400 and 40 CFR 52.21 - Prevention of Significant Deterioration (PSD).

Any subsequent request by TEC for a permanent switch to petcoke/coal syngas firing will require publication of another Notice of Intent to Issue PSD Permit Modification and a Notification of the parties to the original Site Certification PA 92-32 affording another opportunity to provide comments to the Department.

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

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

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

A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by the permit applicant or any of the parties listed below must be filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.69(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

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

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

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

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

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

The complete project file includes the Draft Permit Modification, the application, and the information submitted by the responsible official, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Administrator, New Resource Review Section at 111 South Magnolia Drive, Suite 4, Tallahassee, Florida 32301, or call 850/488-0114 for additional information.
D-327 - 11-17; 1999

TAMPA ELECTRIC

RECEIVED

NOV 12 1999

BUREAU OF AIR REGULATION

November 11, 1999

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Via Fed Ex
Airbill No. 7910 1227 7416

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine – Initial Test

Dear Mr. Fancy:

As per Specific Condition A.49 of the Polk Power Station Title V Permit, Tampa Electric has completed the initial NO_x BACT Determination Test on the combustion turbine while operating on syngas. Accordingly, the final report is attached for your review. If you have any questions, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\SKT122

Enclosure

c/enc: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

Department of
Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

November 1, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles A. Shelnut
General Manager
Tampa Electric Company
Post Office Box 775
Tampa, Florida 33680-0775

Re: Modification of DEP File No. 1050233-002-AC/PSD-FL-194C
Polk Power Station, Unit No.1

Dear Mr. Shelnut:

Enclosed is one copy of the Draft PSD Permit Modification for the Integrated Gasification Combined Cycle facility located at 9895 State Road 37, Mulberry, Polk County. The Department's Intent to Issue PSD Permit Modification and the "PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION" are also included.

The PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION must be published one time only, as soon as possible, in the legal advertisement section of a newspaper of general circulation in the area affected, pursuant to the requirements Chapter 50, Florida Statutes. Proof of publication, i.e., newspaper affidavit, must be provided to the Department's Bureau of Air Regulation office within seven days of publication. Failure to publish the notice and provide proof of publication may result in the denial of the permit.

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please call Mr. Syed Arif, P.E. at 850/921-9528.

Sincerely,

AA Lin 11/1

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

CHF/sa

Enclosures

In the Matter of an
Application for Permit Modification by:

Mr. Charles A. Shelnut
General Manager
Tampa Electric Company
Post Office Box 775
Tampa, Florida 33680-0775

DEP File No. 1050233-002-AC
PSD Permit No. PSD-FL-194C
Polk Power Station
Polk County

______________________________ /

INTENT TO ISSUE PSD PERMIT MODIFICATION

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

The applicant, Tampa Electric Company (TEC), applied on May 21, 1998 to the Department for a modification to the Conditions of Approval (related to fuel use) contained in the Permit for the Prevention of Significant Deterioration (PSD Permit) applicable to Tampa Electric Company, Polk Power Station, Unit No. 1. Presently only syngas from coal gasification may be burned in Unit 1. The request will allow TEC to temporarily burn syngas made from blends of petroleum coke and coal while conducting a series of performance tests on Unit 1.

The Department has permitting jurisdiction under the provisions of Chapter 403, Florida Statutes (F.S.), the Florida Administrative Code (F.A.C.) Chapters 62-4, 62-210, and 62-212, and 40CFR52.21(u). The above actions are not exempt from permitting procedures. The Department has determined that a modification of the PSD Permit is required for the proposed work.

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

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed "Public Notice of Intent to Issue PSD Permit Modification." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. Rule 62-110.106(7)(b), F.A.C., requires that the applicant cause the notice to be published as soon as possible after notification by the Department of its intended action. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in section 50.051, F.S. to the office of the Department issuing the permit. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rules 62-110.106(9) & (11), F.A.C.

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

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

The Department will issue the permit with the attached conditions unless a timely petition for an administrative hearing is filed pursuant to sections 120.569 and 120.57 F.S., before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

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

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

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

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above. Mediation is not available in this proceeding.

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

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

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

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

Executed in Tallahassee, Florida.

A A Lin 11/3
for C. H. Fancy, P.E., Chief
Bureau of Air Regulation

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE PSD PERMIT MODIFICATION (including the PUBLIC NOTICE, and DRAFT PSD Permit Modification) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 11-4-99 to the person(s) listed:

Charles A. Shelnut, TEC*
Gregg Worley, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Buck Oven, DEP PPS
Joe King, Polk County

Clerk Stamp

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

Toni Taber 11-4-99
(Clerk) (Date)

NOTICE TO BE PUBLISH

IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File No. 1050233-002-AC

PSD-FL-194C/PA 92-32

Polk Power Station Integrated Gasification Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Tampa Electric Company (TEC) to conduct a series of performance tests for pollutant emissions while firing syngas made from blends of petroleum coke (petcoke) and coal. The testing will be done on Unit 1 at its Integrated Gasification Combined Cycle Facility (Polk Power Station) located at 9895 State Road 37 South, Mulberry, Polk County. Testing will begin in January 2000 and be conducted over a period of five months. The applicant's name and address are: Tampa Electric Company, Post Office Box 775, Tampa, Florida 333680-0775.

Presently, the plant is only allowed to burn syngas made from coal gasification. Emissions control for SO_2 consists of an acid gas removal unit. Emissions control for NO_x consists of nitrogen diluent injection to the Combined Cycle Unit. The Unit must continue to meet its permitted emission limits during the tests and is required to document any increases in actual emissions caused by burning syngas made from blends of petroleum coke and coal. This documentation is required to determine if a permanent switch to coal/petcoke blend would require a review pursuant to Rule 62-212.400 and 40 CFR 52.21 – Prevention of Significant Deterioration (PSD).

Any subsequent request by TEC for a permanent switch to petcoke/coal syngas firing will require publication of another Notice of Intent to Issue PSD Permit Modification and a Notification of the parties to the original Site Certification PA 92-32 affording another opportunity to provide comments to the Department.

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

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

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

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

NOTICE TO BE PUBLISHED
IN THE NEWSPAPER

filed within fourteen days of receipt of this notice of intent. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

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

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

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

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

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

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

DRAFT

December xx, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Charles A. Shelnut
General Manager
Tampa Electric Company
P.O. Box 775
Tampa, Florida 33680-0775

Dear Mr. Shelnut:

Re: Modification of PSD-FL-194
Tampa Electric Polk Power Station, Unit No. 1
Petroleum Coke/Coal Performance Test Request

The Department has reviewed the request from Tampa Electric Company (TEC) dated May 21, 1998 and supplementary information dated September 8, 1998 and November 10, 1998 to conduct performance tests while firing petroleum coke/coal blends at Polk Power Station, Unit No. 1.

You are hereby authorized to conduct performance tests for pollutant emissions on Polk Power Station Unit No. 1 in Polk County while firing blends of petroleum coke (petcoke) and bituminous coal (coal). All Conditions of Certification and Conditions of Approval in your Site Certification and PSD Permit related to air pollution emission limits and control equipment remain in force.

The performance tests will be conducted in order to gather data regarding pollutant emissions and operational limitations while firing blends of petcoke and coal containing a maximum of 70 percent (% by weight) petcoke. Screening to determine whether future long-term firing of petcoke/coal blends constitutes a modification subject to a review for Prevention of Significant Deterioration (PSD) shall be performed in accordance with Chapter 403, F.S.; Chapters 62-210 through 62-297 and 62-4, F.A.C.; and, Title 40, Code of Federal Regulations (CFR; July 1, 1998 version). The procedure will consist of a comparison of estimates of "representative actual annual emissions" while burning petcoke/coal blends against past actual emissions while burning coal (or estimates of past actual emissions developed from 100 percent coal baseline performance tests).

The performance test results along with any modification application to allow permanent petcoke/coal burning will be reviewed by the Department's Bureau of Air Regulation (BAR) and interested agencies/parties (i.e., DEP Southwest District office, U.S. EPA, National Park Service, etc.).

The performance tests shall be subject to the following conditions:

1. The permittee shall notify, in writing, the Department's BAR office, the Southwest District office, and the Site Certification office at least 15 days prior to commencement of the baseline and the petcoke/coal blend performance tests. A written test result report shall be submitted to these offices within 45 days upon completion of the last test run.

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2. The petcoke/coal blend performance tests shall commence on or before March 1, 2000 and be conducted for not more than 90 days. The tests shall be conducted based on the proposed testing protocol to establish steady state operation and to achieve a maximum (70%) blend. If, for any reasons, a steady state operation of 70% petroleum coke-coal blend, or less, is not achieved, or the testing at 70% petcoke blend or less, presents any operational or environmental concerns, the testing shall be curtailed. The Department shall be immediately notified of the problems that have prevented steady state operations and what steps will be initiated to correct the problem. All testing shall be concluded within 150 days of when petcoke is first introduced into Unit No. 1.

   Estimated Date of Introduction of Fuel Blend: January 1, 2000
   (Note: This is the date at which a run on Petcoke fuel blend may be commenced. It does not indicate that Unit 1 will run continuously from January 1 to June 1, 2000)

   Estimated Testing Schedule:

   Scenario: 55% Petcoke/ 45% Coal

   Estimated date to begin testing: March 1, 2000

   Scenario: 60% Petcoke/40% Coal (if 55% blend emissions are less than baseline)

   Estimated date to begin testing: April 1, 2000

   Scenario: 65% Petcoke/ 35% Coal (if 60% blend emissions are less than baseline)

   Estimated date to begin testing: May 1, 2000

   Scenario: 70% Petcoke/ 30% Coal (if 65% blend emissions are less than baseline)

   Estimated date to begin testing: May 15, 2000

3. Stack emissions from Unit No. 1 shall not exceed the following during baseline and petcoke/coal blend performance tests (based on most stringent of present PSD Permit and Certification Conditions):

   a. Sulfur dioxide (SO_2) - 357 pounds per hour on a 30-day rolling average.

   b. Nitrogen oxides (NO_x) - 222.5 pounds per hour on a 30-day rolling average.

4. As-burned fuel samples shall be collected and analyzed for the sulfur and nitrogen content throughout the petroleum coke-coal blend and the baseline coal test periods.

5. The performance test of the petcoke/coal blends shall be limited to a maximum of 70% petcoke, by weight. The maximum weight of the petroleum coke burned during the petcoke/coal blend performance tests shall not exceed 1628 tons per day, on a dry basis.

6. The maximum sulfur content of the fuel shall not exceed 3.5 percent, by weight, during the baseline tests and the petroleum coke-coal blend tests.

7. SO_2, NO_x, and opacity emissions data shall be recorded using continuous emissions monitors (CEMS) during the baseline and the petcoke/coal blend tests. If the plant CEMS are used for these tests, these systems shall be quality assured pursuant to 40 CFR 60, Appendix F requirements. The data assessment report per 40 CFR 60, Appendix F, for the most recent relative accuracy test audit (RATA) and most recent cylinder gas audit (CGA), shall be submitted with the test report. In addition, stack tests shall be conducted for sulfuric acid mist during the baseline and petcoke/coal blend tests. A satisfactory performance test for each baseline test and each petroleum coke-coal blend shall consist of a minimum of three tests at three runs per test.

8. The pollutant emission results from the petroleum coke/coal blend performance tests shall be used to estimate "representative actual annual emissions" following an operational change per 62-210.200 (12)(d),

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F.A.C., for comparison with actual emissions per Rule 62-210.200(12)(a), F.A.C. The comparison will form the basis of a PSD applicability determination pursuant to 40 CFR 52.21. The results of baseline performance tests when firing coal will be used only to the extent that such information does not already exist or is insufficient to determine actual emissions.

9. Performance tests shall be conducted using EPA Reference Methods, as contained in 40 CFR 60 (Standards of Performance for New Stationary Sources), or any other method approved by the Department, in writing, in accordance with Chapter 62-297, F.A.C.

10. If additional time is needed, the permittee shall request an extension of time and provide the Department with documentation of the progress accomplished to-date and shall identify the work required to complete the performance tests.

11. Daily records (e.g., heat input, MW, fuel input rates, etc.) of IGCC operations while firing the petcoke/coal blend and while firing only coal (baseline) during the tests shall be required.

12. The Southwest District office may conduct a Type I or II stack audit.

13. Complete documentation (recording) of any firing of the petroleum coke-coal blend shall be required (i.e., all CEMs records; testing results; materials utilized, by weight; etc.) and kept on file for a minimum of five years.

14. The authorized petroleum coke-coal blend performance tests shall not result in the release of objectionable odors pursuant to Rule 62-296.320(2), F.A.C.

15. Performance testing shall cease as soon as possible if Unit No. 1 operations are not in accordance with the conditions in the air section of Site Certification No. PA 92-32, PSD Permit No. PSD-FL-194, or this authorization protocol. Performance testing shall not resume until appropriate measures to correct the problem(s) have been implemented.

16. The performance tests for pollutant emissions shall be conducted under the direct supervision of a professional engineer registered in Florida.

17. This Department action is only to authorize the petroleum coke-coal blend performance tests. Any firing of petroleum coke beyond the 90 days of testing within the 150 day period approved to conduct such tests will be deemed a violation of the Site Certification No. PA 92-32 and Permit No. PSD-FL-194.

18. The Southwest District office shall be immediately notified, in writing upon completion of the final test.

19. The testing series shall include emissions tests for each of the petroleum coke/coal blends and pollutants with the source operating at permitted capacity. Permitted capacity is defined as 90-100 percent of the capacity allowed by Site Certification PA 92-32 and Permit PSD-FL-194. If it is impracticable to test at permitted capacity, then the source may be tested at a lesser rate. However, the tests **shall** be conducted at capacities within 10 percent of each other and corrected to the same heat input basis. Furthermore, subsequent source operation with a petroleum coke-coal blend, if requested and approved by the Department, shall be limited to 110 percent of the tested capacity for that blend until new tests are conducted, which requires prior Department authorization.

20. Attachments to be incorporated:
    - Tampa Electric Company letters dated May 21, September 8 and November 10, 1998.
    - FDEP letters dated June 16 and October 5, 1998.

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A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order (permit modification) has the right to seek judicial review of it under Section 120.68, F.S., by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.

____
Howard L. Rhodes, Director
Division of Air Resources
Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this permit modification was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on ______________ to the person(s) listed:

Charles A. Shelnut, TEC*
Buck Oven, DEP PPS
Bill Thomas, DEP SWD
Gregg Worley, EPA
John Bunyak, NPS
Patrick Shell, TEC

Clerk Stamp

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

________________________ __________________
(Clerk) (Date)

Florida Department of
Environmental Protection

Memorandum

TO: Clair Fancy

FROM: Syed Arif *Syed Arif*

DATE: October 28, 1999

SUBJECT: Tampa Electric Company (TEC)
PSD-FL-194C, Polk Power Station Unit 1, Petroleum Coke/Coal
Performance Test Request

Attached is the Public Notice and draft permit modification to allow TEC conduct performance tests for pollutant emissions while gasifying blends of petroleum coke and bituminous coal. All Conditions of Certification and PSD permit conditions related to emission limits and control equipment remain in force.

Control equipment includes acid gas removal unit for SO_2 control and nitrogen diluent injection in the combined cycle unit for NO_x control. Any subsequent request by TEC for a permanent switch to petcoke/coal syngas firing will require another publication of a Notice of Intent to Issue a Permit Modification to the PSD Permit and a Notification of the parties to the original Site Certification PA 92-32 affording another opportunity to provide comments to the Department.

TEC provided a waiver of 90 day time limit for issuance of permit. The clock has been tolled until October 31, 1999. November 1, 1999 will be day 71 for this project.

I recommend your approval and signature.

SA/a

Attachments

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "*Return Receipt Requested*" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Charles Shelnut, G.M.
TECo
PO Box 775
Tampa, Fl
33680-0775

4a. Article Number
Z 031 391 999

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

7. Date of Delivery
NOV - 8 1999

5. Received By: (*Print Name*)

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

6. Signature: (*Addressee or Agent*)
X

PS Form **3811**, December 1994 102595-98-B-0229 **Domestic Return Receipt**

Thank you for using Return Receipt Service.

Z 031 391 999

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

Sent to Charles Shelnut	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 11-4-99 1050233-002-AC PSD-FI-194(e)	

PS Form **3800**, April 1995

Al

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SEP 07 1999

BUREAU OF AIR REGULATION

August 31, 1999

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine

Dear Mr. Fancy:

In conjunction with the Polk Power Station Title V Permit (#1050233-001-AV), PSD (PSD-FL-194), and Conditions of Certification (PA 92-32) TEC is required to perform bimonthly NO_x testing on the combustion turbine for a period of 12 to 18 months following the demonstration period, which will expire September 30, 1999. Condition A.50 of the Title V Permit states:

> *"One month after the test period ends... the permittee shall submit to the Department a NO_x recommended BACT Determination as if it were a new source, using the data gathered on this facility, other similar facilities and the manufacturer's research."*

TEC feels that sufficient data already exists to submit a NO_x recommended BACT Determination for the syngas combustion turbine in lieu of performing the specified testing.

Facility Data

Polk Unit 1 is a 192 MW combined cycle combustion turbine with a heat recovery steam generator. Syngas is produced through a coal slurry gasification process and fed to the combustion turbine where it is utilized as the primary fuel.

While operating on syngas, the combustion turbine emits approximately 18-20 ppm NO_x @ 15% O_2, which is controlled via nitrogen injection prior to combustion. Over the course of a year, however, this rate varies depending on ambient weather, fuel characteristics and operational parameters. Consequently, TEC feels that a NO_x emission limit of 25 ppm will provide the necessary regulatory flexibility to ensure efficient operation while satisfying the BACT Determination requirement of the Title V permit.

Similar Facility Data

Wabash River Station in Vigo County, Indiana is the only other facility in the nation that operates a permitted syngas combustion turbine identical to the unit at Polk Power Station. The BACT Determination for this facility was 25 ppm NO_x @ 15% O_2. Syngas containing about 2.0-mol % nitrogen is used as fuel at this facility compared to syngas containing about 3.5-mol % nitrogen at Polk Power

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P. O. BOX 111 TAMPA, FL 33601-0111

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HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

Station. Since the fuel used at Polk Power Station contains more fuel bound nitrogen, NO_x emissions are higher as a result of combustion. Therefore, TEC must employ more effective NO_x controls to achieve the same NO_x reductions that are being seen at Wabash River Station. In light of this as well as the fact that Wabash River Station and Polk Power Station operate identical combustion turbines, TEC feels that a NO_x limit of 25 ppm is appropriate for the Polk Power Station facility.

Manufacturer's Research

In early 1997, General Electric hired Cubix Corporation to perform base load emissions testing on the combustion turbine. The result of this testing showed an average NO_x concentration of 19.7 ppm @ 15% O_2. However, due to low ambient temperatures and the cooling effect of nitrogen injection, NO_x emissions typically increase during the winter months. Therefore, TEC feels that 25 ppm is an appropriate limit to allow for fluctuation in seasonal operating parameters and still operate the unit efficiently.

Conclusion

Tampa Electric Company feels that NO_x emissions data collected from both Polk Power Station and Wabash River Station supports the position that a NO_x BACT Determination limit of 25 ppm @ 15% O_2 is appropriate for the combustion turbine at Polk Power Station. Tampa Electric has based this conclusion on data from annual compliance tests, data from Wabash River Station as well as manufacturer's research and feels that additional data collection through testing is not necessary. Therefore, Tampa Electric requests that the Department review this issue and agree that a NO_x emission limit of 25 ppm @ 15% O_2 while operating on syngas is an appropriate limit for above referenced unit. If you have any questions or concerns, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\SKT112

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

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CORPORATE ENVIRONMENTAL SERVICES

AIR PROGRAMS REPORT

NITROGEN OXIDES - BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION

SOURCE EMISSION TEST #1

POLK POWER GENERATING STATION

AIRS # 1050233

UNIT NO.1 COMBUSTION TURBINE &
HEAT RECOVERY STEAM GENERATOR
FIRED ON SYNGAS

OCTOBER 14, 1999

Prepared by Tampa Electric Company
Corporate Environmental Services
November 5, 1999

REPORT CERTIFICATION

I have calculated and reviewed all data in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 11/9/99 Signature

QA/QC Coordinator
Senior Environmental Technician
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

The sampling and analysis performed for this report were carried out under my direction, and I hereby certify that this test report is authentic and accurate.

Date 11/9/99 Signature David A Smith

Test Team Leader
Senior Environmental Technician
Air Services and Auditing
Corporate Environmental Services
Tampa Electric Company

I have reviewed the testing details and results in this report, and hereby certify that the test report is authentic and accurate to the best of my knowledge.

Date 11/10/99 Signature

Air Administrator
Air Programs
Environmental Planning
Tampa Electric Company

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1.0 SUMMARY OF RESULTS

On October 14, 1999, Corporate Environmental Services, Air Services and Auditing group of Tampa Electric Company performed source emission tests on IGCC Unit No. 1 at the Polk Power Electrical Generating Station. The combustion turbine was fired with syngas from a coal gasification system. This was the initial bi-monthly testing conducted to satisfy requirements in Title V permit no. 1050233-001-AV for NOx Best Available Control Technology (BACT) determinations. Testing was performed according to USEPA test methods stipulated in 40 CFR Part 60, Appendix A.

The Nitrogen Oxides (NO_x) emission rate was derived from three test runs. The calculated average was 17 ppm corrected to 15% oxygen on a dry basis.

During the tests on October 14, 1999, Unit No. 1 Combustion Turbine was operated at an average load of 191 megawatts. Details of turbine operation are included in Appendix B.

2.0 SOURCE DESCRIPTION/TEST PROCEDURES

Polk Power Electrical Generating Station is located at County Road 630 approximately 13 miles southwest of Bartow, Polk County, Florida. Unit No. 1 is a IGCC generating unit, 192 MW capacity when fired with Syngas fuel. The source sampling location consists of a circular stack 19 ft. in diameter with four sample ports located 90° apart on the stack circumference. A diagram of the stack sampling location is included in Figure 1 and 2 along with other pertinent information on the test site.

Nitrogen Oxides sampling was performed in accordance with USEPA Reference Method 20 (40 CFR Part 60, Appendix A) "Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions from Stationary Gas Turbines". Testing was performed using a Thermo Environmental Model 10 A/R Chemiluminescent NO-NO_x Gas Analyzer. Details of fuel bound nitrogen is found in Appendix B.

Diluent sampling was performed in accordance with USEPA Reference Method 3-A (40 CFR Part 60, Appendix A), "Determination of Oxygen and Carbon Dioxide concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)". Testing was performed using a Servomex 1400 B Oxygen Analyzer.

TCEMS Description

The following discussion briefly outlines the operation principles of Corporate Environmental Services Transportable Continuous Emissions Monitoring System (TCEMS). Additional information on instrument operation may be found in the individual instrument manuals provided by the manufacturers. A schematic of the TCEMS set-up is presented in Figure 3.

Servomex Model 1400 B O_2 Analyzer

The Servomex 1400B oxygen analyzer measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell.

Thermo Environmental Instruments Model 10A/R NO/NOx Analyzer

The Thermo Environmental Instruments model 10A/R NO/NOx analyzer automatically and continuously determines the concentration of nitric oxide (NO) and/or oxides of nitrogen (NO_x) in a flowing gas mixture. The analytical technique is chemiluminescence.

To measure NO concentrations, the gas sample to be analyzed is blended with ozone (O_3) in a reaction chamber. The resulting chemiluminescence activity is monitored through an optical filter by a high sensitivity photomultiplier tube positioned at one end of the chamber.

This filter and photomultiplier combination responds to light of a narrow wavelength band unique to the NO/O_3 reaction, producing an interference free signal. The output from the photomultiplier is linearly proportional to the NO concentration.

To measure NO_x concentrations (i.e., NO plus NO_2), the sample gas flow is diverted through a NO_2-to-NO converter. The chemiluminescent action in the reaction chamber to the converter effluent is linearly proportional to the NO_x concentration entering the converter.

Data Acquisition System

The data acquisition system (DAS) developed by Entropy Environmentalists Inc., uses a portable personal computer with an internal 32 bit analog-to-digital converter with an external 16 channel multiplexer. In addition to providing an instantaneous display of analyzer responses, the DAS can average data, calculate emission rates, and document analyzer calibrations. The test results and calibrations are stored on the hard disk and printed on a dot matrix printer.

TCEMS Sample Handling System

The extractive monitors utilized in the TCEMS require that the effluent stream be conditioned to eliminate any possible interference (i.e., water vapor and particulate matter), before being transported and injected into each analyzer. Figure 3 depicts a schematic of the entire sample handling system. The major components of this system are listed below:

- Gas transport tubing
- Moisture removal system
- Sampling pump

Gas Transport Tubing

Two separate 1/4 inch O.D. Teflon tubes were used for the sample gas transport.

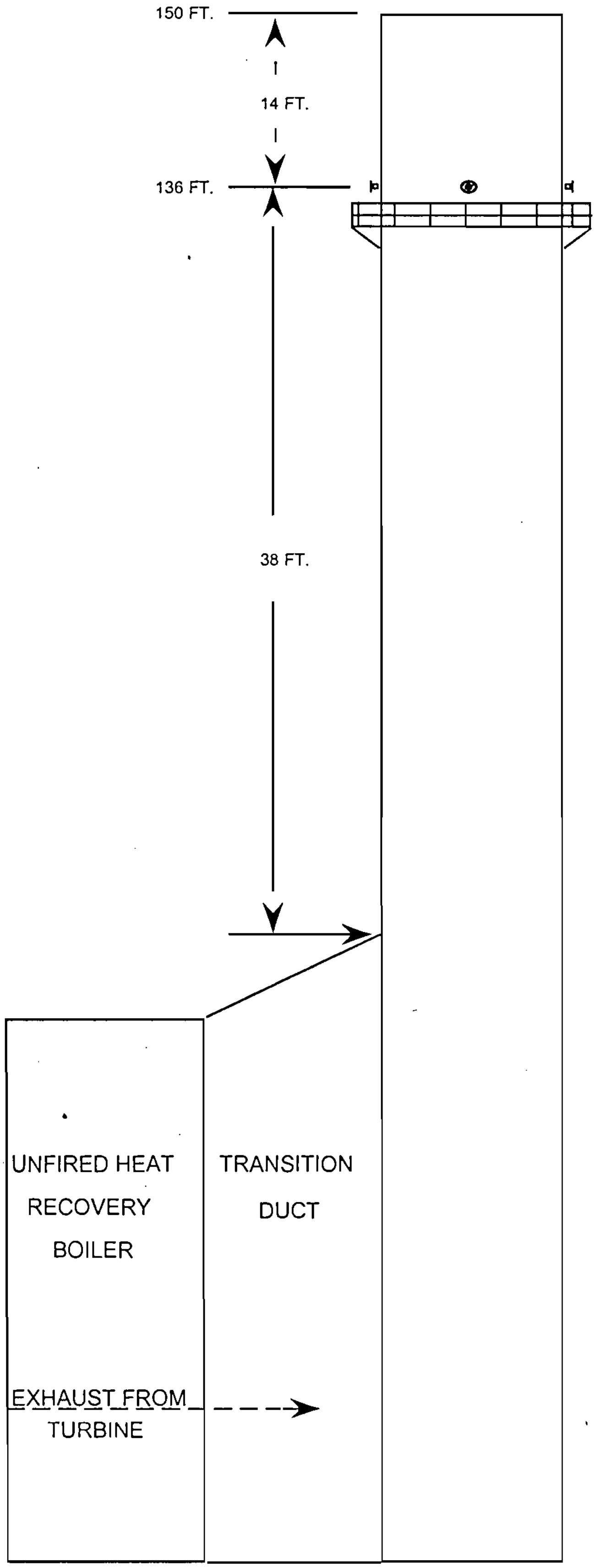
Moisture Removal System

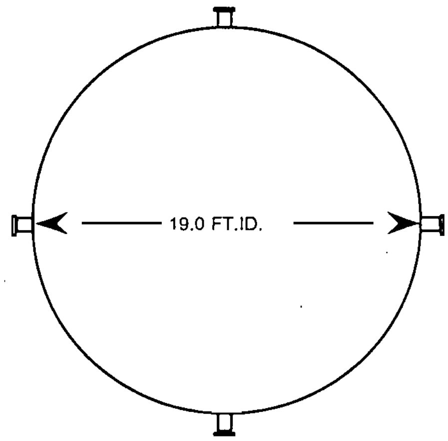
The moisture removal system was comprised of an ice bath condenser, constructed of a 30-foot section of 3/8 inch O.D. Teflon tubing wrapped in a 12-inch coil. Effluent travels through this coil and then passes, in series, through two stainless steel moisture traps where the condensate drops out and is removed via a condensate discharge pump. With the exception of the discharge pump, the entire assembly is chilled in an ice bath.

Sampling Pump

The Thomas Model 2107CE20-TFE pump is used to transport the effluent sample through the conditioning system to the analyzers. All internal parts of the pump that come into contact with the gas sample are constructed of 316 stainless steel or Teflon.

POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION





PORT LOCATION PLAN

STACK DIAMETERS DOWNSTREAM
FROM DISTURBANCE = 2.0

STACK DIAMETERS UPSTREAM
FROM DISTURBANCE = 0.7

STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.

OXYGEN
TRAVERSE
POINTS

1 - 2.51"	7 - 36.71"
2 - 7.30"	8 - 44.23"
3 - 12.54"	9 - 52.44"
4 - 18.01"	10 - 62.02"
5 - 23.94"	11 - 73.64"
6 - 30.10"	12 - 90.74"

ADD 13" PORT LENGTH
TO POINTS

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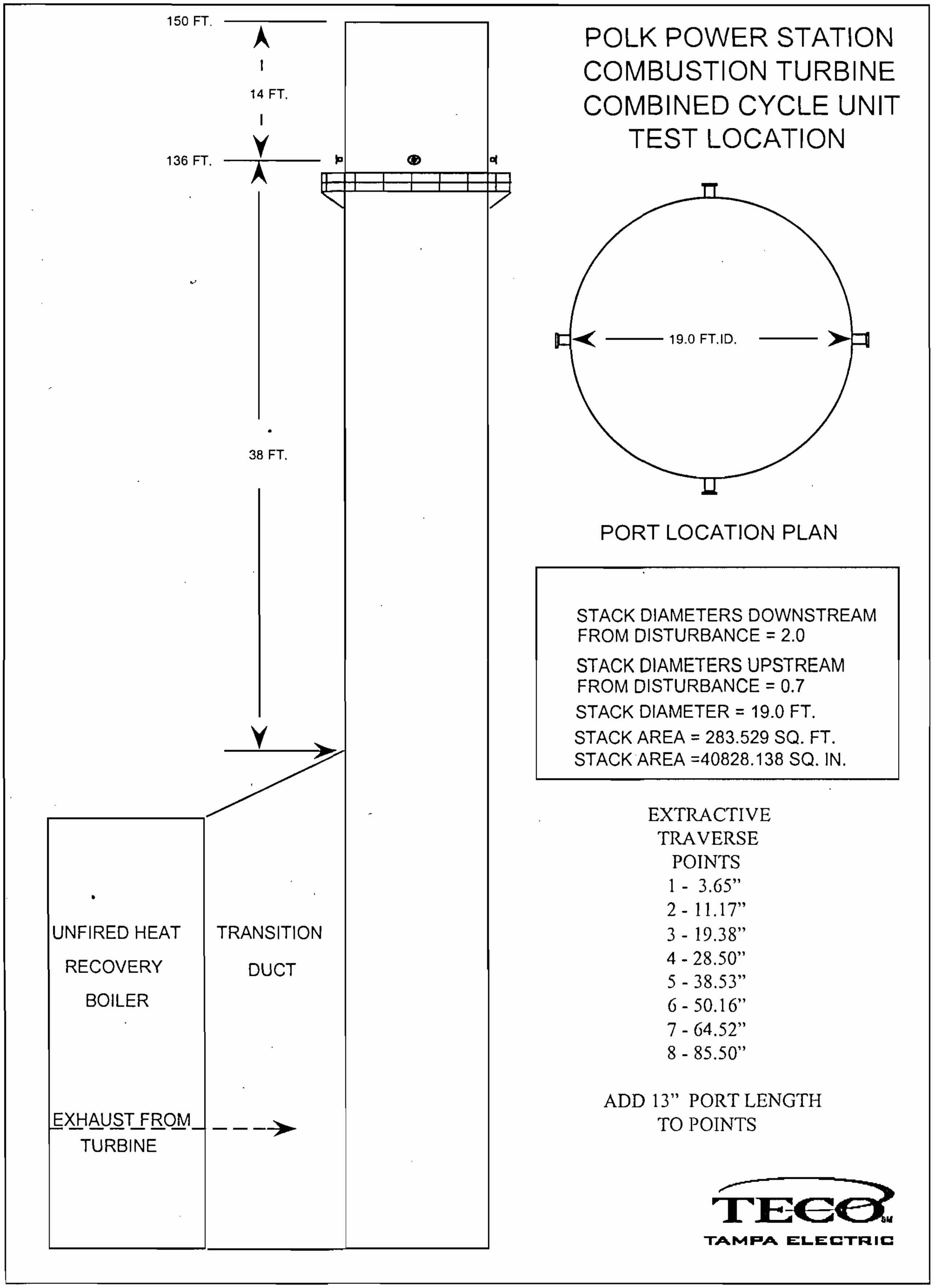
FIGURE 1



POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION
150 FT.
14 FT.
136 FT.
38 FT.
19.0 FT.ID.
PORT LOCATION PLAN
STACK DIAMETERS DOWNSTREAM FROM DISTURBANCE = 2.0
STACK DIAMETERS UPSTREAM FROM DISTURBANCE = 0.7
STACK DIAMETER = 19.0 FT.
STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.
EXTRACTIVE
TRAVERSE
POINTS
1 - 3.65"
2 - 11.17"
3 - 19.38"
4 - 28.50"
5 - 38.53"
6 - 50.16"
7 - 64.52"
8 - 85.50"
ADD 13" PORT LENGTH
TO POINTS
UNFIRED HEAT
RECOVERY
BOILER
TRANSITION
DUCT
EXHAUST FROM
TURBINE
TECO
TAMPA ELECTRIC

FIGURE 2

∞

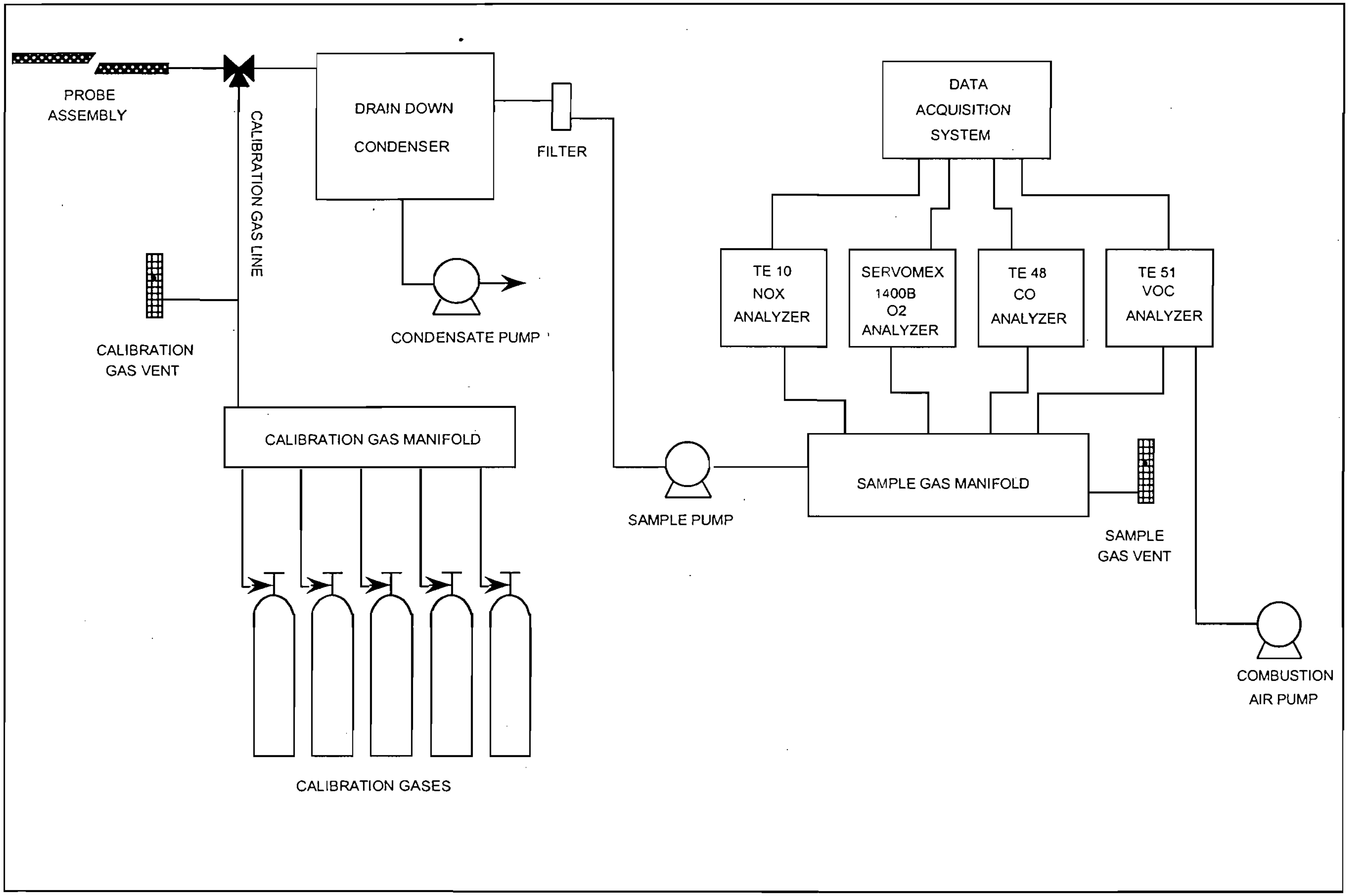


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FIGURE 3
Extractive Method Sampling Trains

USEPA METHODS 3A, 10, 20, 25 CEM SYSTEM LAYOUT

3.0 TEST RESULTS

POLK POWER ELECTRICAL GENERATING STATION
NITROGEN OXIDES BACT TESTING

IGCC COMBUSTION TURBINE UNIT 1
OCTOBER 14, 1999

RUN NO.	TIME	O2%	ppm NOx Dry	CORRECTED 15% O2
1	1149 – 1249	11.88	27.0	16.7
2	1301 – 1401	11.85	27.2	16.7
3	1416 – 1516	11.83	28.0	16.7
	Average	11.85	27.4	16.7

Corrected NOx calculated as:

Concentration (ppm NOx) x Cd / (20.9/20.9 - $\%O_2$)

Where:

Cd = NOx coefficient of 5.9

SHAREDATA\AIRSERVICES\WPSOURCE\POLK\NOXBACTSUM.DOC

APPENDIX A

SOURCE TEST CALCULATIONS

APPENDIX A - 1

NITROGEN OXIDE CALCULATIONS

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 1

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 10/14/99

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	0.7	1.2	1.0
24.0 ppm NOx	25.3	25.4	25.4
0.00 % Oxygen	0.05	0.02	0.04
11.96 % Oxygen	12.14	12.10	12.12

$\bar{C}$(NOx) = 27.0 $\bar{C}$(O2) = 11.88

CORRECTED RESULTS

26 ppm NOx
11.7 % Oxygen
16.7 ppm NOx @15% O2

Corr. Conc. = $C_{ma}(\bar{C} - C_o)/(C_m - C_o)$ (for NOx)

Corr. Conc. = $[(C_{ma} - C_{oa})/(C_m - C_o)](\bar{C} - C_m) + C_{ma}$ (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

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1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 2

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 10/14/99

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	1.2	2.0	1.6
24.0 ppm NOx	25.4	25.8	25.6
0.00 % Oxygen	0.02	0.02	0.02
11.96 % Oxygen	12.10	12.09	12.10

$\bar{C}$(NOx) = 27.2 $\bar{C}$(O2) = 11.85

CORRECTED RESULTS

26 ppm NOx
11.7 % Oxygen
16.7 ppm NOx @15% O2

Corr. Conc. = $\bar{C}$ma(C - Co)/(Cm - Co) (for NOx)

Corr. Conc. = [(Cma - Coa)/(Cm - Co)](C - Cm$\bar{)}$ + Cma (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8094
1.194E-07

CALCULATION OF AVERAGE NITROGEN OXIDES EMISSIONS

RUN: 3

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 10/14/99

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.0 ppm NOx	2.0	2.9	2.5
24.0 ppm NOx	25.8	26.6	26.2
0.00 % Oxygen	0.02	0.03	0.03
11.96 % Oxygen	12.09	12.08	12.09

$\bar{C}$(NOx) = 28.0 $\bar{C}$(O2) = 11.83

CORRECTED RESULTS

26 ppm NOx
11.7 % Oxygen
16.7 ppm NOx @15% O2

Corr. Conc. = $C_{ma}(\bar{C} - C_o)/(C_m - C_o)$ (for NOx)

Corr. Conc. = $[(C_{ma} - C_{oa})/(C_m - C_o)](\bar{C} - C_m) + C_{ma}$ (for O2)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Coa = actual low-level calibration gas concentration
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

E = (ppm NOx)(5.9)/(20.9 - % Oxygen)

8094
1.194E-07

APPENDIX A - 2

OXYGEN CALCULATIONS

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 1

SOURCE: POLK POWER STATION UNT 1 BACT STUDY

TEST DATE: 10/14/99

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.05	0.02	0.04
11.96 % Oxygen	12.14	12.10	12.12

$\bar{C}$ = 11.88

CORRECTED RESULTS

11.7 % Oxygen

Corrected Conc. = Cma($\bar{C}$ - Co)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 2

SOURCE: POLK POWER STATION UNT 1 BACT STUDY

TEST DATE: 10/14/99

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.02	0.02	0.02
11.96 % Oxygen	12.10	12.09	12.10

$\bar{C}$ = 11.85

CORRECTED RESULTS

11.7 % Oxygen

Corrected Conc. = Cma($\bar{C}$ - Co)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

CALCULATION OF AVERAGE OXYGEN CONCENTRATION

RUN: 3

SOURCE: POLK POWER STATION UNT 1 BACT STUDY

TEST DATE: 10/14/99

GAS VALUE	INITIAL CAL	FINAL CAL	MEAN CAL
0.00 % Oxygen	0.02	0.03	0.03
11.96 % Oxygen	12.09	12.08	12.09

$\bar{C}$ = 11.83

CORRECTED RESULTS

11.7 % Oxygen

Corrected Conc. = Cma(C - $\bar{\text{Co}}$)/(Cm - Co)

Where: $\bar{C}$ = mean reference measurement
Co = mean zero calibration response
Cm = mean mid or upscale calibration gas response
Cma = actual mid or upscale calibration gas concentration

APPENDIX B

TURBINE DATA

1 MINUTE AVERAGES

TEST PERIOD 1

10/14/99 9:00							
10/14/99 15:30		Load (MW)		Fuel Flow (lb/sec)	N2 Flow (lb/sec)	Inlet Temp. (deg F)	Inlet Pressure
	1TSYFI910	1PWRJI900	1GMLJI962	1TSYJYI910	1NITFI920A	1TMSTI922M	1TMSPI909
14-Oct-99 09:00:00	102.5062103	192.08992	192.2987671	174.954071	118.2088623	75.31647491	29.70635414
14-Oct-99 09:01:00	102.7073746	191.8222504	192.2927246	174.954071	118.2024612	74.97769165	29.70630455
14-Oct-99 09:02:00	102.443924	191.9255676	192.2866669	174.954071	118.1960602	74.77236938	29.70625496
14-Oct-99 09:03:00	102.8199005	192.2231903	192.2806244	174.954071	118.1896667	74.92636108	29.70620537
14-Oct-99 09:04:00	102.7282715	192.1581573	192.2745667	174.954071	118.1832657	74.76528168	29.70615387
14-Oct-99 09:05:00	102.3066635	192.0931396	192.2685089	174.954071	118.1768646	74.92054749	29.70610428
14-Oct-99 09:06:00	102.5166397	192.0281067	192.2624664	174.954071	118.1704636	75.31647491	29.70605469
14-Oct-99 09:07:00	102.5436401	192.0397797	192.2564087	174.954071	118.1640701	75.31647491	29.7060051
14-Oct-99 09:08:00	102.1367111	191.6584625	192.250351	174.954071	118.1576691	75.03427887	29.70595551
14-Oct-99 09:09:00	102.7266006	191.6448364	192.2540131	174.954071	118.151268	75.11159515	29.70590591
14-Oct-99 09:10:00	102.6680832	191.9403992	192.271286	174.954071	118.1448669	75.18891144	29.70585632
14-Oct-99 09:11:00	102.5425644	191.7804413	192.2885437	174.954071	118.1384735	75.26622009	29.70580673
14-Oct-99 09:12:00	102.5449371	191.6204681	192.3058167	174.954071	118.1320724	75.60093689	29.70575523
14-Oct-99 09:13:00	102.5763702	192.1143188	192.3230743	174.954071	118.1256714	75.54104614	29.70570564
14-Oct-99 09:14:00	102.5352402	191.883606	192.3403473	174.954071	118.119278	75.48116302	29.70565605
14-Oct-99 09:15:00	102.334816	191.8204346	192.357605	174.954071	118.1128769	75.42127228	29.70560646
14-Oct-99 09:16:00	102.5286865	191.3960724	192.3748779	174.954071	118.1064758	75.36138916	29.70555687
14-Oct-99 09:17:00	102.5153656	191.9415741	192.3921356	174.954071	118.1000748	75.1450882	29.70550728
14-Oct-99 09:18:00	102.654953	191.8485107	192.4094086	174.954071	118.0936813	75.64302063	29.70545769
14-Oct-99 09:19:00	102.7574997	191.7554626	192.4266663	174.954071	118.0872803	75.74512482	29.7054081
14-Oct-99 09:20:00	102.3645248	191.8808289	192.4439392	174.954071	118.0808792	75.847229	29.7053566
14-Oct-99 09:21:00	102.3625717	191.7828827	192.4611969	174.954071	118.0744781	75.88705444	29.70530701
14-Oct-99 09:22:00	102.379837	191.8640289	192.4784698	174.954071	118.0680847	75.89227295	29.70525742
14-Oct-99 09:23:00	102.379837	191.927063	192.2904205	174.954071	118.0616837	75.91634369	29.70520782
14-Oct-99 09:24:00	102.0410767	192.0444336	192.0294037	174.954071	118.0552826	75.76483154	29.70515823
14-Oct-99 09:25:00	102.3615265	191.8240814	192.0900726	174.954071	118.0488815	75.63110352	29.70510864
14-Oct-99 09:26:00	102.6009216	191.6116791	192.1507568	174.954071	118.0424881	75.83531952	29.70505905
14-Oct-99 09:27:00	102.7295761	191.6063232	192.2114258	174.954071	118.036087	76.03952789	29.70500946
14-Oct-99 09:28:00	102.299263	191.3451538	192.2971802	174.954071	118.029686	76.24373627	29.70495796
14-Oct-99 09:29:00	102.8196793	191.698349	192.418045	174.954071	118.0232925	76.09571075	29.70490837
14-Oct-99 09:30:00	102.5470047	191.4645386	192.2871246	174.954071	118.0168915	75.94171906	29.70485878
14-Oct-99 09:31:00	102.7748947	191.7687073	192.080658	174.954071	118.0104904	76.22188568	29.70480919
14-Oct-99 09:32:00	102.4687653	191.6801758	192.2619476	174.954071	118.0040894	75.95524597	29.7047596

14-Oct-99 09:33:00	102.3683167	191.9094696	192.216629	174.954071	117.9976959	76.41597748	29.70471001
14-Oct-99 09:34:00	102.4161453	191.5153809	192.105011	174.954071	117.9912949	76.60016632	29.70466042
14-Oct-99 09:35:00	102.7094345	191.8649597	192.3447113	174.954071	117.9848938	76.78435516	29.70461082
14-Oct-99 09:36:00	102.620903	191.8187408	192.4594421	174.954071	117.9784927	76.96854401	29.70455933
14-Oct-99 09:37:00	102.5189972	192.0215454	192.3866882	174.954071	117.9720993	77.15273285	29.70450974
14-Oct-99 09:38:00	102.130806	191.6722565	192.3139343	174.954071	117.9656982	76.93497467	29.70446014
14-Oct-99 09:39:00	102.1917114	192.2325745	192.2411652	174.954071	117.9592972	76.92214203	29.70441055
14-Oct-99 09:40:00	102.5934601	191.7436523	192.1684113	174.954071	117.9528961	77.38412476	29.70436096
14-Oct-99 09:41:00	102.7218399	191.8202057	192.2770386	174.954071	117.9465027	76.80664825	29.70431137
14-Oct-99 09:42:00	102.5271454	191.8769379	192.2871246	174.954071	117.9401016	77.00468445	29.70426178
14-Oct-99 09:43:00	102.7277451	191.7553711	192.0722656	174.954071	117.9337006	76.97090912	29.70421219
14-Oct-99 09:44:00	102.8862152	191.6623077	192.2333984	174.954071	117.9272995	77.08734131	29.70416069
14-Oct-99 09:45:00	102.4501495	191.9298401	192.3945465	174.954071	117.9209061	76.92449951	29.7041111
14-Oct-99 09:46:00	102.4695587	191.7975464	192.317337	174.954071	117.914505	77.00118256	29.70406151
14-Oct-99 09:47:00	102.6255341	191.7975464	192.1202545	174.954071	117.9081039	77.0778656	29.70401192
14-Oct-99 09:48:00	102.3155899	191.7975464	192.2225647	174.954071	117.9017105	77.15454865	29.70396233
14-Oct-99 09:49:00	102.3399811	191.8876038	192.3248596	174.954071	117.8953094	77.55180359	29.70391273
14-Oct-99 09:50:00	102.1881332	191.4197693	192.4271545	174.954071	117.8889084	77.67414093	29.70386314
14-Oct-99 09:51:00	102.7343292	191.9116058	192.4641724	174.954071	117.8825073	77.64334106	29.70381165
14-Oct-99 09:52:00	102.4147034	191.5531006	192.4032288	174.954071	117.8761139	77.75997925	29.70376205
14-Oct-99 09:53:00	102.6504593	191.1734772	192.468399	174.954071	117.8697128	77.65788269	29.70371246
14-Oct-99 09:54:00	102.1574478	191.1530457	192.5237885	174.954071	117.8633118	77.5557785	29.70366287
14-Oct-99 09:55:00	102.2048264	191.8512726	192.3183289	174.954071	117.8569107	77.77680969	29.70361328
14-Oct-99 09:56:00	102.7403336	191.917923	192.2286987	174.954071	117.8505173	78.08137512	29.70356369
14-Oct-99 09:57:00	102.1580048	191.4791718	192.3012085	174.954071	117.8441162	77.97871399	29.7035141
14-Oct-99 09:58:00	102.7706757	191.2755127	192.3737335	174.954071	117.8377151	77.87604523	29.70346451
14-Oct-99 09:59:00	102.5675201	191.8363037	192.4462433	174.954071	117.8313141	77.92889404	29.70341301
14-Oct-99 10:00:00	102.3566513	191.875885	192.4381866	174.954071	117.8249207	77.90667725	29.70336342
14-Oct-99 10:01:00	102.6293259	191.6980286	192.3173218	174.954071	117.8185196	77.91539764	29.70331383
14-Oct-99 10:02:00	102.4147339	191.9314117	192.2412262	174.954071	117.8121185	78.22338867	29.70326424
14-Oct-99 10:03:00	102.5028229	191.5396881	192.2277985	174.954071	117.8057251	77.88146973	29.70321465
14-Oct-99 10:04:00	102.5946121	191.5097504	192.2143707	174.954071	117.799324	78.11058044	29.70316505
14-Oct-99 10:05:00	102.6113205	191.8433228	192.200943	174.954071	117.792923	78.33969879	29.70311546
14-Oct-99 10:06:00	102.2434616	191.8433228	192.1875153	174.954071	117.7865219	78.56880951	29.70306587
14-Oct-99 10:07:00	102.5751266	191.8433228	192.1740875	174.954071	117.7801285	78.62890625	29.70301437
14-Oct-99 10:08:00	102.6764755	191.8433228	192.1606598	174.954071	117.7737274	78.13708496	29.70296478
14-Oct-99 10:09:00	102.5612946	191.9188995	192.1472321	174.954071	117.7673264	78.19828033	29.70291519
14-Oct-99 10:10:00	102.3338547	192.2480011	192.1338043	174.954071	117.7609253	78.25947571	29.7028656
14-Oct-99 10:11:00	102.5590515	191.9914246	192.2971802	174.954071	117.7545319	78.32067108	29.70281601
14-Oct-99 10:12:00	102.4598618	191.8845215	192.5213165	174.954071	117.7481308	78.38186646	29.70276642
14-Oct-99 10:13:00	102.6608505	191.6509705	192.483963	174.954071	117.7894745	78.4184494	29.70271683

14-Oct-99 10:14:00	102.2719727	191.575058	192.4466095	174.954071	117.8342361	78.13613129	29.70266724
14-Oct-99 10:15:00	102.4710922	191.6647034	192.409256	174.954071	117.8789978	78.34145355	29.70261574
14-Oct-99 10:16:00	102.5825272	191.9708862	192.3719025	174.954071	117.9237518	78.54677582	29.70256615
14-Oct-99 10:17:00	102.5663757	192.0813599	192.334549	174.954071	117.9685135	78.75209808	29.70251656
14-Oct-99 10:18:00	102.771492	191.8982544	192.2971802	174.954071	118.0132675	78.59810638	29.70246696
14-Oct-99 10:19:00	102.4868546	191.8927002	192.2598267	174.954071	118.0580292	78.44411469	29.70241737
14-Oct-99 10:20:00	102.3249054	191.7853241	192.2224731	174.954071	118.1027832	78.45918274	29.70236778
14-Oct-99 10:21:00	102.543808	191.830719	192.1851196	174.954071	118.1475449	78.55321503	29.70231819
14-Oct-99 10:22:00	103.0348969	192.2826233	192.1477661	174.954071	118.1922989	78.67560577	29.7022686
14-Oct-99 10:23:00	102.5703049	192.466568	192.1763306	174.954071	118.2370605	78.79799652	29.7022171
14-Oct-99 10:24:00	102.6367798	192.0914154	192.2971802	174.954071	118.2818222	78.92038727	29.70216751
14-Oct-99 10:25:00	102.7130966	191.8970642	192.418045	174.954071	118.3265762	79.04277802	29.70211792
14-Oct-99 10:26:00	102.4370575	191.9997253	192.3349152	174.954071	118.3713379	79.0020752	29.70206833
14-Oct-99 10:27:00	102.4409256	191.0110016	192.1779175	174.954071	118.4160919	78.92476654	29.70201874
14-Oct-99 10:28:00	102.496788	191.5149384	192.2977753	174.954071	118.4608536	78.84745026	29.70196915
14-Oct-99 10:29:00	102.5611191	191.8931885	192.265274	174.954071	118.5056076	78.7701416	29.70191956
14-Oct-99 10:30:00	102.5914612	191.6430817	192.2038879	174.954071	118.5503693	78.55400085	29.70186996
14-Oct-99 10:31:00	102.7264175	191.8006897	192.383667	174.954071	118.5951309	78.70736694	29.70181847
14-Oct-99 10:32:00	102.685318	191.5778046	192.4849396	174.954071	118.6398849	78.86073303	29.70176888
14-Oct-99 10:33:00	102.6188507	192.2138214	192.4763184	174.954071	118.6846466	79.01409149	29.70171928
14-Oct-99 10:34:00	102.7964096	191.9286194	192.4676819	174.954071	118.7294006	78.86320496	29.70166969
14-Oct-99 10:35:00	102.631073	191.5623627	192.4590454	174.954071	118.7741623	78.84989166	29.7016201
14-Oct-99 10:36:00	102.4451065	191.7348938	192.4504089	174.954071	118.8189163	79.00431061	29.70157051
14-Oct-99 10:37:00	102.8637695	191.9074097	192.4417877	174.954071	118.863678	79.15872955	29.70152092
14-Oct-99 10:38:00	102.5389099	192.1567383	192.4331512	174.954071	118.908432	79.31314087	29.70147133
14-Oct-99 10:39:00	102.7061615	191.5964203	192.4245148	174.954071	118.9531937	79.46755981	29.70141983
14-Oct-99 10:40:00	102.3285904	191.9224243	192.4158936	174.954071	118.9887466	79.62197113	29.70137024
14-Oct-99 10:41:00	102.9399261	191.4244537	192.4072571	174.954071	118.9832993	79.37834167	29.70132065
14-Oct-99 10:42:00	102.7023926	191.256424	192.3986206	174.954071	118.9778519	79.61579132	29.70127106
14-Oct-99 10:43:00	102.3615265	191.5718994	192.3899841	174.954071	118.9724045	79.45922852	29.70122147
14-Oct-99 10:44:00	102.6883774	191.827652	192.3813629	174.954071	118.9669571	79.73778534	29.70117188
14-Oct-99 10:45:00	102.4995346	191.6776123	192.3727264	174.954071	118.9615097	79.83705139	29.70112228
14-Oct-99 10:46:00	102.5652695	191.9567871	192.367691	174.954071	118.9560623	79.93631744	29.70107269
14-Oct-99 10:47:00	102.3745193	191.1925049	192.367691	174.954071	118.9506149	79.97597504	29.70102119
14-Oct-99 10:48:00	102.2535324	191.9101105	192.367691	174.954071	118.9451675	79.92620087	29.7009716
14-Oct-99 10:49:00	102.2252884	191.7344971	192.367691	174.954071	118.9397202	79.87643433	29.70092201
14-Oct-99 10:50:00	102.5063477	191.0565491	192.367691	174.954071	118.9342728	79.82666779	29.70087242
14-Oct-99 10:51:00	102.5129776	191.6661072	192.367691	174.954071	118.9288254	79.77689362	29.70082283
14-Oct-99 10:52:00	102.5815582	191.8241119	192.367691	174.954071	118.923378	79.72712708	29.70077324
14-Oct-99 10:53:00	102.358223	191.8494263	192.367691	174.954071	118.9179306	79.77629852	29.70072365
14-Oct-99 10:54:00	102.3582153	192.1331482	192.367691	174.954071	118.9124832	79.69145966	29.70067406

14-Oct-99 10:55:00	102.5720978	191.4649811	192.392868	174.954071	118.9070358	79.54772949	29.70062256
14-Oct-99 10:56:00	102.4733505	191.5844116	192.4532928	174.954071	118.9015884	79.06521606	29.70057297
14-Oct-99 10:57:00	102.2653885	191.9311218	192.5137177	174.954071	118.8961411	79.48970032	29.70052338
14-Oct-99 10:58:00	102.6795654	191.9608612	192.5741425	174.954071	118.8906937	79.94514465	29.70047379
14-Oct-99 10:59:00	102.8940735	192.1148834	192.5716248	174.954071	118.8852463	79.99588013	29.70042419
14-Oct-99 11:00:00	102.7854004	191.9503326	192.4809875	174.954071	118.8798065	79.90325165	29.7003746
14-Oct-99 11:01:00	102.9940796	191.4725189	192.3903351	174.954071	118.8743591	79.40854645	29.70032501
14-Oct-99 11:02:00	102.8339462	192.1161804	192.2996979	174.954071	118.8689117	79.60991669	29.70027542
14-Oct-99 11:03:00	102.8476791	191.7973938	192.3475342	174.954071	118.8634644	79.81128693	29.70022392
14-Oct-99 11:04:00	102.7643661	191.9486084	192.3869781	174.954071	118.858017	80.00871277	29.70017433
14-Oct-99 11:05:00	102.5525436	191.4990692	192.1432495	174.954071	118.8525696	80.16270447	29.70012474
14-Oct-99 11:06:00	103.071312	191.8670349	192.0399475	174.954071	118.8471222	80.29360199	29.70007515
14-Oct-99 11:07:00	102.7498703	191.8805389	192.120285	174.954071	118.8416748	80.31070709	29.70002556
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14-Oct-99 13:33:00	102.9688416	191.5576935	192.2971802	174.954071	117.2875519	82.30126953	29.69274902
14-Oct-99 13:34:00	102.6739578	191.8048706	192.3153229	174.954071	117.3025742	82.40449524	29.69269943
14-Oct-99 13:35:00	102.6038361	191.4170532	192.1587524	174.954071	117.3175964	82.19116211	29.69264984
14-Oct-99 13:36:00	102.7935104	192.0084076	192.21315	174.954071	117.3326111	82.29438782	29.69260025
14-Oct-99 13:37:00	102.650528	191.7700653	192.105835	174.954071	117.3476334	82.39761353	29.69255066
14-Oct-99 13:38:00	102.8910141	191.492157	192.3475494	174.954071	117.3626556	82.50083923	29.69250107

14-Oct-99 13:39:00	102.8049545	191.5759735	192.4801483	174.954071	117.3776779	82.18772125	29.69245148
14-Oct-99 13:40:00	102.6697311	192.0995178	192.4600067	174.954071	117.3927002	82.50083923	29.69240189
14-Oct-99 13:41:00	102.6737289	191.7938385	192.4398651	174.954071	117.4077148	82.38619995	29.69235039
14-Oct-99 13:42:00	102.930069	191.7026215	192.4197235	174.954071	117.4227371	82.59152222	29.6923008
14-Oct-99 13:43:00	102.9990311	191.5823059	192.3995819	174.954071	117.4377594	82.79684448	29.69225121
14-Oct-99 13:44:00	102.679039	192.0476379	192.3794403	174.954071	117.4527817	82.53619385	29.69220161
14-Oct-99 13:45:00	102.8477402	191.8290405	192.3592834	174.954071	117.4677963	82.77289581	29.69215202
14-Oct-99 13:46:00	102.8038406	192.2919464	192.3391418	174.954071	117.4828186	82.72498322	29.69210243
14-Oct-99 13:47:00	102.6934662	191.7426147	192.3190002	174.954071	117.4978409	82.62232208	29.69205284
14-Oct-99 13:48:00	102.6211472	192.2419586	192.2988586	174.954071	117.5128632	82.51966095	29.69200325
14-Oct-99 13:49:00	103.2531738	191.72612	192.278717	174.954071	117.5278854	82.62557983	29.69195175
14-Oct-99 13:50:00	102.7369003	191.5066528	192.2585754	174.954071	117.5429001	82.77832031	29.69190216
14-Oct-99 13:51:00	102.8175278	191.9711304	192.2805786	174.954071	117.5579224	82.57783508	29.69185257
14-Oct-99 13:52:00	103.1705475	192.1278839	192.3616028	174.954071	117.5729446	82.73567963	29.69180298
14-Oct-99 13:53:00	102.4393463	191.7975464	192.442627	174.954071	117.5879669	83.12708282	29.69175339
14-Oct-99 13:54:00	102.8469925	191.9506378	192.3314362	174.954071	117.6029892	83.25540924	29.6917038
14-Oct-99 13:55:00	102.7019348	191.7371216	192.1779175	174.954071	117.6180038	83.00901794	29.69165421
14-Oct-99 13:56:00	102.6911926	191.5173798	192.2977753	174.954071	117.6330261	83.05863953	29.69160461
14-Oct-99 13:57:00	102.6510468	192.0264282	192.3339386	174.954071	117.6480484	82.95597839	29.69155312
14-Oct-99 13:58:00	102.5952911	191.7953033	192.2529144	174.954071	117.6630707	82.85330963	29.69150352
14-Oct-99 13:59:00	102.64534	191.5809326	192.1718903	174.954071	117.6780853	83.03237915	29.69145393
14-Oct-99 14:00:00	102.6275558	191.8512726	192.332016	174.954071	117.6931076	82.87880707	29.69140434
14-Oct-99 14:01:00	103.2744751	191.832489	192.5839996	174.954071	117.7081299	82.72522736	29.69135475
14-Oct-99 14:02:00	103.0817108	191.7360077	192.5230713	174.954071	117.7231522	82.57165527	29.69130516
14-Oct-99 14:03:00	102.9090271	191.6040192	192.5400543	174.954071	117.7381744	82.41808319	29.69125557
14-Oct-99 14:04:00	102.741478	191.7856598	192.3878326	174.954071	117.7531891	82.26451111	29.69124413
14-Oct-99 14:05:00	102.8616486	191.7156067	192.0846863	174.954071	117.7682114	81.9239502	29.69124413
14-Oct-99 14:06:00	102.9245911	191.9059296	192.1016083	174.954071	117.7832336	82.02605438	29.69124413
14-Oct-99 14:07:00	102.9221497	192.0777588	192.1185303	174.954071	117.7982559	82.12815857	29.69124413
14-Oct-99 14:08:00	103.0933151	192.1185913	192.135437	174.954071	117.8132782	81.92678833	29.69124413
14-Oct-99 14:09:00	103.1880646	191.7838898	192.152359	174.954071	117.8282928	81.87459564	29.69124413
14-Oct-99 14:10:00	103.0322876	191.6968994	192.169281	174.954071	117.8433151	82.1312561	29.69124413
14-Oct-99 14:11:00	103.3303528	192.2323608	192.186203	174.954071	117.8583374	81.97725677	29.69124413
14-Oct-99 14:12:00	102.9131393	191.7566376	192.203125	174.954071	117.8733597	81.97725677	29.69124413
14-Oct-99 14:13:00	102.8553314	191.6688995	192.2200317	174.954071	117.888382	82.09176636	29.69124413
14-Oct-99 14:14:00	102.8732224	191.6076813	192.2369537	174.954071	117.9033966	81.96331787	29.69124413
14-Oct-99 14:15:00	102.9762039	191.8748322	192.2468262	174.954071	117.9184189	82.10186768	29.69124413
14-Oct-99 14:16:00	102.6752548	191.7928772	192.2468262	174.954071	117.9334412	82.02858734	29.69124413
14-Oct-99 14:17:00	102.9370422	191.9009552	192.2468262	174.954071	117.9484634	82.50083923	29.69124413
14-Oct-99 14:18:00	102.6297836	192.1672211	192.2468262	174.954071	117.9634781	82.24932098	29.69124413
14-Oct-99 14:19:00	102.7658386	192.2448273	192.2468262	174.954071	117.9785004	82.4631958	29.69124413

14-Oct-99 14:20:00	102.4576569	191.9857941	192.2468262	174.954071	117.9935226	82.25787354	29.69124413
14-Oct-99 14:21:00	103.1621857	191.9998779	192.4219666	174.954071	118.0085449	82.05254364	29.69124413
14-Oct-99 14:22:00	102.8175888	191.6852722	192.5973053	174.954071	118.0235672	81.89504242	29.69124413
14-Oct-99 14:23:00	102.6624069	191.8509674	192.4522858	174.954071	118.0385818	82.04840851	29.69124413
14-Oct-99 14:24:00	102.9108582	192.142334	192.3592987	174.954071	118.0536041	82.2017746	29.69124413
14-Oct-99 14:25:00	102.9398499	191.7225189	192.3391571	174.954071	118.0686264	82.35514069	29.69124413
14-Oct-99 14:26:00	102.8838425	191.5105133	192.3190155	174.954071	118.0836487	82.18772125	29.69124413
14-Oct-99 14:27:00	102.8228226	191.632431	192.2988586	174.954071	118.0894165	82.18772125	29.69124413
14-Oct-99 14:28:00	102.8218079	192.0556946	192.278717	174.954071	118.0905609	82.18772125	29.69124413
14-Oct-99 14:29:00	102.9784546	191.4772491	192.2585754	174.954071	118.0916977	82.18772125	29.69124413
14-Oct-99 14:30:00	103.013443	192.0545044	192.4482422	174.954071	118.0928421	82.18772125	29.69124413
14-Oct-99 14:31:00	102.7395706	191.5231781	192.4281158	174.954071	118.0939865	82.18772125	29.69124413
14-Oct-99 14:32:00	102.8435898	191.4174805	192.0722656	174.954071	118.0951233	81.70639038	29.69124413
14-Oct-99 14:33:00	102.9506302	191.776123	192.2333984	174.954071	118.0962677	81.86165619	29.69124413
14-Oct-99 14:34:00	103.0265503	192.0580444	192.3945465	174.954071	118.0974121	81.42288208	29.69124413
14-Oct-99 14:35:00	103.1492386	192.0329895	192.2871246	174.954071	118.0985489	81.26889038	29.69124413
14-Oct-99 14:36:00	102.6418381	192.0079346	192.0386963	174.954071	118.0996933	81.76525116	29.69124413
14-Oct-99 14:37:00	103.0654449	191.9828949	192.1192627	174.954071	118.1008377	81.36316681	29.69124413
14-Oct-99 14:38:00	102.9276428	191.95784	192.1998291	174.954071	118.1019821	81.62257385	29.69124413
14-Oct-99 14:39:00	102.6545029	191.6894684	192.2804108	174.954071	118.1031189	82.08080292	29.69124413
14-Oct-99 14:40:00	102.830307	191.7458038	192.3609772	174.954071	118.1042633	82.18772125	29.69124413
14-Oct-99 14:41:00	102.6207809	191.9682922	192.4415436	174.954071	118.1054077	82.03885651	29.69124413
14-Oct-99 14:42:00	102.4971161	191.7823944	192.4741821	174.954071	118.1065445	82.10421753	29.69124413
14-Oct-99 14:43:00	103.012619	191.9714966	192.439743	174.954071	118.1076889	82.19798279	29.69124413
14-Oct-99 14:44:00	102.8424911	191.7026215	192.4052887	174.954071	118.1088333	82.65996552	29.69124413
14-Oct-99 14:45:00	102.7242203	191.6089325	192.3708344	174.954071	118.1099777	82.40331268	29.69124413
14-Oct-99 14:46:00	102.6636581	191.7724762	192.3363953	174.954071	118.1111145	82.48800659	29.69124413
14-Oct-99 14:47:00	102.5621338	192.3161163	192.3019409	174.954071	118.1122589	82.94998932	29.69124413
14-Oct-99 14:48:00	102.6503067	192.5662994	192.2675018	174.954071	118.1134033	82.81395721	29.69124413
14-Oct-99 14:49:00	102.7805405	191.5048676	192.2589569	174.954071	118.1145401	83.12708282	29.69124413
14-Oct-99 14:50:00	102.6654892	191.5673828	192.2893066	174.954071	118.1156845	82.78366089	29.69124413
14-Oct-99 14:51:00	102.4545517	191.7550201	192.3196411	174.954071	118.1168289	82.82936096	29.69124413
14-Oct-99 14:52:00	102.7434311	191.7352905	192.3499908	174.954071	118.1179733	82.96795654	29.69124413
14-Oct-99 14:53:00	102.8658447	191.6574554	192.3739929	174.954071	118.1191101	83.12194824	29.69124413
14-Oct-99 14:54:00	102.857872	191.9797363	192.3890991	174.954071	118.1202545	83.44020081	29.69124413
14-Oct-99 14:55:00	102.9017029	192.2845917	192.4042053	174.954071	118.1213989	83.16423035	29.69124413
14-Oct-99 14:56:00	102.3432083	191.9291687	192.4193115	174.954071	118.1225357	82.99139404	29.69124413
14-Oct-99 14:57:00	102.6701965	192.0462341	192.4344177	174.954071	118.1236801	83.12708282	29.69124413
14-Oct-99 14:58:00	102.6442184	191.8733368	192.4495239	174.954071	118.1248245	83.12708282	29.69124413
14-Oct-99 14:59:00	102.7874832	191.9366455	192.4646301	174.954071	118.1259689	82.87088776	29.69124413
14-Oct-99 15:00:00	102.6239777	191.4553223	192.4797363	174.954071	118.1271057	83.02616119	29.69124413

14-Oct-99 15:01:00	102.6891327	191.5775146	192.4532928	174.954071	118.1282501	83.01928711	29.69124413
14-Oct-99 15:02:00	102.5864868	191.877533	192.3686981	174.954071	118.1293945	82.91496277	29.69124413
14-Oct-99 15:03:00	102.5640869	192.1209717	192.3334503	174.954071	118.1305313	83.03468323	29.69124413
14-Oct-99 15:04:00	102.6989059	192.0343933	192.3672943	174.954071	118.1316757	82.98848724	29.69124413
14-Oct-99 15:05:00	102.7336807	191.9478149	192.401123	174.954071	118.1328201	83.20989227	29.69124413
14-Oct-99 15:06:00	102.665184	192.1955872	192.434967	174.954071	118.1339569	83.52042389	29.69124413
14-Oct-99 15:07:00	102.9436035	192.112442	192.4687958	174.954071	118.1351013	83.92271423	29.69124413
14-Oct-99 15:08:00	102.9845352	191.7139435	192.471756	174.954071	118.1362457	83.44020081	29.69124413
14-Oct-99 15:09:00	103.0101013	191.5833588	192.4314728	174.954071	118.1373901	83.32909393	29.69124413
14-Oct-99 15:10:00	102.9529724	191.955658	192.3911896	174.954071	118.1385269	82.83705902	29.69124413
14-Oct-99 15:11:00	102.9566345	191.7170105	192.3620911	174.954071	118.1396713	82.99105072	29.69124413
14-Oct-99 15:12:00	102.6379089	191.7078094	192.3486633	174.954071	118.1408157	83.09055328	29.69124413
14-Oct-99 15:13:00	102.8352814	191.650589	192.3352356	174.954071	118.1419525	83.44020081	29.69124413
14-Oct-99 15:14:00	103.1241837	191.6732941	192.3218079	174.954071	118.1430969	83.44020081	29.69124413
14-Oct-99 15:15:00	102.8191452	192.1272888	192.3083801	174.954071	118.1442413	83.44020081	29.69124413
14-Oct-99 15:16:00	102.8457108	191.7549591	192.2949524	174.954071	118.1453857	83.7481842	29.69124413
14-Oct-99 15:17:00	102.7456055	191.7475739	192.2815247	174.954071	118.1465225	83.64552307	29.69124413
14-Oct-99 15:18:00	102.8520279	192.0500183	192.2680969	174.954071	118.1476669	83.54286194	29.69124413
14-Oct-99 15:19:00	102.888855	191.7559662	192.2546539	174.954071	118.1488113	83.44020081	29.69124413
14-Oct-99 15:20:00	102.6673508	191.7535706	192.1461182	174.954071	118.1499481	83.72200775	29.69124413
14-Oct-99 15:21:00	103.13517	191.5789948	192.2266846	174.954071	118.1510925	83.15274811	29.69124413
14-Oct-99 15:22:00	103.1314774	191.7796936	192.5127106	174.954071	118.1522369	83.26940918	29.69124413
14-Oct-99 15:23:00	103.2250443	191.6397247	192.4546967	174.954071	118.1533813	83.42467499	29.69124413
14-Oct-99 15:24:00	102.9429016	191.9774323	192.3966827	174.954071	118.1545181	83.21057892	29.69124413
14-Oct-99 15:25:00	103.187355	191.5106659	192.3386841	174.954071	118.1556625	83.70635223	29.69124413
14-Oct-99 15:26:00	102.7343521	191.5987701	192.2806702	174.954071	118.1568069	83.18768311	29.69124413
14-Oct-99 15:27:00	103.2304001	191.4481049	192.2971802	174.954071	118.1579437	83.61985779	29.69124413
14-Oct-99 15:28:00	103.0399628	191.6803436	192.4180298	174.954071	118.1590881	83.63169098	29.69124413
14-Oct-99 15:29:00	102.8704147	191.9083252	192.5388947	174.954071	118.1602325	83.4764328	29.69124413
14-Oct-99 15:30:00	102.7596359	191.6734924	192.3576202	174.954071	118.1613693	83.75331879	29.69124413

Run 1

Record#	DATE	TIME	PC1CO211	PC1GEN12	PC1NOX13	PC1NOX14	PC1PRS15	PC1TMP16	PC1SYN17
1	10/14/1999	115000	8.123	190.991	0.097	28.595	29.715	299.685	66.714
2	10/14/1999	115100	8.101	190.882	0.097	28.498	29.714	299.471	66.714
3	10/14/1999	115200	8.099	191.046	0.097	28.510	29.715	297.470	66.714
4	10/14/1999	115300	8.080	191.635	0.098	28.590	29.716	297.481	66.714
5	10/14/1999	115400	8.102	191.564	0.097	28.482	29.718	296.805	66.714
6	10/14/1999	115500	8.110	191.311	0.097	28.557	29.716	296.678	66.714
7	10/14/1999	115600	8.123	191.301	0.097	28.689	29.711	296.582	66.714
8	10/14/1999	115700	8.128	191.289	0.097	28.710	29.713	296.493	66.714
9	10/14/1999	115800	8.107	191.378	0.097	28.446	29.713	297.325	66.714
10	10/14/1999	115900	8.111	191.573	0.097	28.592	29.712	298.617	66.714
11	10/14/1999	120000	8.107	191.337	0.097	28.623	29.710	298.607	66.714
12	10/14/1999	120100	8.085	190.602	0.096	28.210	29.921	298.830	66.714
13	10/14/1999	120200	5.957	191.072	0.106	22.894	29.710	298.920	66.714
14	10/14/1999	120300	4.537	190.993	0.091	14.943	29.711	300.875	66.714
15	10/14/1999	120400	6.893	190.706	0.096	24.047	29.708	300.770	66.714
16	10/14/1999	120500	7.451	190.967	0.095	25.686	29.710	296.026	66.714
17	10/14/1999	120600	7.590	191.313	0.096	26.378	29.707	295.964	66.714
18	10/14/1999	120700	7.661	191.258	0.097	26.904	29.707	297.485	66.714
19	10/14/1999	120800	7.698	190.930	0.096	26.835	29.711	297.991	66.714
20	10/14/1999	120900	7.769	191.299	0.095	26.883	29.708	299.809	66.714
21	10/14/1999	121000	7.813	191.312	0.096	27.252	29.709	301.359	66.714
22	10/14/1999	121100	7.858	191.496	0.097	27.562	29.707	300.618	66.714
23	10/14/1999	121200	7.872	191.092	0.097	27.806	29.708	299.580	66.714
24	10/14/1999	121300	7.913	191.527	0.098	27.994	29.706	299.396	66.714
25	10/14/1999	121400	7.943	191.527	0.097	27.957	29.705	297.794	66.714
26	10/14/1999	121500	7.948	190.874	0.097	28.062	29.708	297.828	66.714
27	10/14/1999	121600	7.971	190.653	0.096	27.862	29.708	299.028	66.714
28	10/14/1999	121700	7.987	191.478	0.096	27.746	29.708	299.078	66.714
29	10/14/1999	121800	7.993	191.113	0.096	27.956	29.705	299.556	66.714
30	10/14/1999	121900	7.980	191.505	0.096	27.775	29.707	299.977	66.714
31	10/14/1999	122000	7.972	191.144	0.096	27.716	29.710	300.060	66.714
32	10/14/1999	122100	8.020	191.476	0.097	28.104	29.705	300.052	66.714
33	10/14/1999	122200	8.017	191.326	0.097	28.248	29.703	300.437	66.714
34	10/14/1999	122300	8.030	190.969	0.096	28.059	29.702	302.222	66.714
35	10/14/1999	122400	8.011	191.211	0.097	28.106	29.699	302.135	66.714
36	10/14/1999	122500	8.012	190.618	0.097	28.081	29.705	296.266	66.714
37	10/14/1999	122600	8.013	190.916	0.097	28.217	29.701	295.996	66.714
38	10/14/1999	122700	8.023	191.390	0.097	28.257	29.699	298.818	66.714
39	10/14/1999	122800	8.053	191.361	0.097	28.261	29.701	298.780	66.714
40	10/14/1999	122900	8.053	191.173	0.097	28.360	29.700	298.929	66.714
41	10/14/1999	123000	8.052	191.241	0.097	28.335	29.702	298.928	66.714
42	10/14/1999	123100	8.055	191.184	0.098	28.498	29.699	302.116	66.714
43	10/14/1999	123200	8.047	191.519	0.097	28.304	29.702	303.370	66.714
44	10/14/1999	123300	8.041	190.947	0.097	28.226	29.698	300.929	66.714
45	10/14/1999	123400	7.988	190.938	0.096	27.828	29.695	300.122	66.714
46	10/14/1999	123500	7.974	191.285	0.097	28.038	29.698	301.101	66.714
47	10/14/1999	123600	7.995	191.170	0.096	27.914	29.694	301.473	66.714
48	10/14/1999	123700	8.052	191.082	0.096	28.046	29.693	299.789	66.714
49	10/14/1999	123800	8.035	190.962	0.096	28.039	29.696	298.813	66.714
50	10/14/1999	123900	8.072	190.976	0.096	28.101	29.694	299.845	66.714
51	10/14/1999	124000	8.076	190.768	0.096	28.202	29.695	300.426	66.714
52	10/14/1999	124100	8.095	190.855	0.095	27.954	29.694	298.948	66.714
53	10/14/1999	124200	8.105	191.411	0.096	28.259	29.694	297.700	66.714
54	10/14/1999	124300	8.112	191.250	0.097	28.433	29.696	297.598	66.714
55	10/14/1999	124400	8.103	190.793	0.096	28.242	29.694	297.340	66.714
56	10/14/1999	124500	8.119	190.917	0.096	28.261	29.691	297.810	66.714
57	10/14/1999	124600	8.089	191.315	0.096	28.105	29.694	298.206	66.714
58	10/14/1999	124700	8.089	191.145	0.096	28.037	29.698	298.191	66.714

59	10/14/1999	124800	8.087	190.874	0.096	28.057	29.695	298.190	66.714
60	10/14/1999	124900	8.105	191.012	0.096	28.324	29.692	298.167	66.714
61	/ /								
62	/ /	AVE	7.893	191.154	0.097	27.661	29.708	298.981	66.714

Run 2

Record#	DATE	TIME	PC1CO211	PC1GEN12	PC1NOX13	PC1NOX14	PC1PRS15	PC1TMP16	PC1SYN17
1	10/14/1999	130200	8.072	191.925	0.096	28.085	29.682	300.839	66.714
2	10/14/1999	130300	8.089	191.289	0.096	28.060	29.680	302.425	66.714
3	10/14/1999	130400	8.076	191.067	0.096	28.051	29.684	301.480	66.714
4	10/14/1999	130500	8.084	190.882	0.096	28.038	29.683	296.976	66.714
5	10/14/1999	130600	8.054	191.299	0.095	27.863	29.683	296.995	66.714
6	10/14/1999	130700	8.055	190.913	0.096	27.913	29.684	301.744	66.714
7	10/14/1999	130800	8.076	190.898	0.095	27.882	29.682	301.746	66.714
8	10/14/1999	130900	8.070	191.080	0.095	27.717	29.681	299.119	66.714
9	10/14/1999	131000	8.071	191.292	0.095	27.937	29.680	297.980	66.714
10	10/14/1999	131100	8.072	191.509	0.094	27.556	29.683	300.505	66.714
11	10/14/1999	131200	8.057	191.334	0.095	27.646	29.683	301.159	66.714
12	10/14/1999	131300	8.073	191.316	0.094	27.373	29.686	300.294	66.714
13	10/14/1999	131400	8.115	191.307	0.094	27.544	29.684	299.395	66.714
14	10/14/1999	131500	8.131	191.295	0.094	27.854	29.682	298.145	66.714
15	10/14/1999	131600	8.138	191.457	0.094	27.638	29.677	295.461	66.714
16	10/14/1999	131700	8.161	191.370	0.094	27.855	29.680	295.778	66.714
17	10/14/1999	131800	8.162	191.295	0.094	27.874	29.682	300.498	66.714
18	10/14/1999	131900	8.164	190.852	0.094	27.877	29.681	300.509	66.714
19	10/14/1999	132000	8.161	191.383	0.094	27.948	29.679	297.416	66.714
20	10/14/1999	132100	8.150	191.327	0.095	28.096	29.679	297.366	66.714
21	10/14/1999	132200	8.167	191.245	0.094	27.930	29.678	297.347	66.714
22	10/14/1999	132300	8.166	191.318	0.094	27.841	29.674	297.340	66.714
23	10/14/1999	132400	8.120	191.564	0.095	27.935	29.676	300.309	66.714
24	10/14/1999	132500	8.103	191.626	0.095	27.991	29.676	302.386	66.714
25	10/14/1999	132600	8.061	191.416	0.095	27.769	29.676	301.527	66.714
26	10/14/1999	132700	8.038	191.086	0.095	27.794	29.675	300.614	66.714
27	10/14/1999	132800	8.024	190.890	0.095	27.681	29.675	299.666	66.714
28	10/14/1999	132900	8.035	191.281	0.094	27.373	29.675	296.709	66.714
29	10/14/1999	133000	8.044	191.548	0.094	27.335	29.677	297.341	66.714
30	10/14/1999	133100	8.070	191.110	0.095	27.715	29.679	301.877	66.714
31	10/14/1999	133200	8.074	190.768	0.094	27.443	29.676	301.867	66.714
32	10/14/1999	133300	8.087	190.822	0.094	27.672	29.678	299.952	66.714
33	10/14/1999	133400	8.091	190.942	0.095	27.863	29.676	299.393	66.714
34	10/14/1999	133500	8.105	190.963	0.094	27.603	29.679	298.553	66.714
35	10/14/1999	133600	8.128	191.319	0.094	27.673	29.678	298.207	66.714
36	10/14/1999	133700	8.132	190.818	0.095	27.881	29.678	300.404	66.714
37	10/14/1999	133800	8.122	190.841	0.094	27.679	29.676	302.062	66.714
38	10/14/1999	133900	8.119	191.322	0.094	27.722	29.670	301.157	66.714
39	10/14/1999	134000	8.082	191.294	0.095	27.820	29.669	299.665	66.714
40	10/14/1999	134100	8.090	191.353	0.096	28.084	29.672	299.996	66.714
41	10/14/1999	134200	8.126	191.466	0.094	27.837	29.671	300.737	66.714
42	10/14/1999	134300	8.113	191.285	0.094	27.771	29.668	300.753	66.714
43	10/14/1999	134400	8.138	191.264	0.094	27.734	29.668	303.307	66.714
44	10/14/1999	134500	8.114	191.079	0.095	27.944	29.669	301.254	66.714
45	10/14/1999	134600	8.096	191.125	0.095	27.936	29.669	295.618	66.714
46	10/14/1999	134700	8.098	191.280	0.095	27.806	29.670	296.497	66.714
47	10/14/1999	134800	8.082	191.063	0.095	27.900	29.670	298.451	66.714
48	10/14/1999	134900	8.095	190.674	0.096	28.195	29.670	299.042	66.714
49	10/14/1999	135000	8.102	191.102	0.096	28.145	29.668	302.598	66.714
50	10/14/1999	135100	8.091	191.740	0.096	28.046	29.666	301.934	66.714
51	10/14/1999	135200	8.066	191.308	0.096	28.193	29.669	298.701	66.714
52	10/14/1999	135300	8.092	191.307	0.097	28.416	29.667	298.575	66.714
53	10/14/1999	135400	8.087	190.903	0.096	28.250	29.666	298.097	66.714
54	10/14/1999	135500	8.081	190.650	0.096	28.105	29.663	299.713	66.714
55	10/14/1999	135600	8.068	190.865	0.096	28.059	29.664	302.472	66.714
56	10/14/1999	135700	8.061	191.065	0.095	27.908	29.663	302.557	66.714
57	10/14/1999	135800	8.051	191.068	0.096	27.918	29.665	302.806	66.714
58	10/14/1999	135900	8.067	191.455	0.096	27.965	29.661	301.798	66.714

59	10/14/1999	140000	8.042	190.982	0.096	27.932	29.662	297.004	66.714
60	10/14/1999	140100	8.041	191.226	0.095	27.772	29.662	297.681	66.714
61	/ /								
62	/ /	AVE	8.093	191.192	0.095	27.857	29.675	299.697	66.714

Run 3

Record#	DATE	TIME	PC1CO211	PC1GEN12	PC1NOX13	PC1NOX14	PC1PRS15	PC1TMP16	PC1SYN17
1	10/14/1999	141700	8.043	191.411	0.095	27.809	29.663	296.801	66.714
2	10/14/1999	141800	8.057	191.314	0.095	27.703	29.661	297.234	66.714
3	10/14/1999	141900	8.079	191.184	0.096	28.006	29.660	298.595	66.714
4	10/14/1999	142000	8.078	191.386	0.097	28.329	29.662	298.320	66.714
5	10/14/1999	142100	8.090	191.345	0.096	28.215	29.662	296.961	66.714
6	10/14/1999	142200	8.097	191.088	0.095	28.001	29.662	297.161	66.714
7	10/14/1999	142300	8.068	191.161	0.096	28.188	29.658	300.173	66.714
8	10/14/1999	142400	8.039	191.237	0.096	28.013	29.661	300.036	66.714
9	10/14/1999	142500	8.035	191.136	0.095	27.797	29.662	298.797	66.714
10	10/14/1999	142600	8.055	191.179	0.095	27.813	29.661	298.828	66.714
11	10/14/1999	142700	8.057	190.998	0.095	27.875	29.661	297.809	66.714
12	10/14/1999	142800	8.069	191.262	0.096	27.985	29.660	297.833	66.714
13	10/14/1999	142900	8.060	191.133	0.096	28.023	29.657	301.251	66.714
14	10/14/1999	143000	8.047	191.235	0.095	27.790	29.658	301.380	66.714
15	10/14/1999	143100	8.041	190.925	0.096	27.903	29.658	299.841	66.714
16	10/14/1999	143200	8.036	191.056	0.096	27.939	29.657	299.701	66.714
17	10/14/1999	143300	8.065	190.901	0.096	28.020	29.657	299.199	66.714
18	10/14/1999	143400	8.070	191.102	0.095	27.849	29.655	299.070	66.714
19	10/14/1999	143500	8.076	191.270	0.095	27.906	29.654	298.466	66.714
20	10/14/1999	143600	8.102	191.070	0.095	27.778	29.657	298.197	66.714
21	10/14/1999	143700	8.079	191.061	0.095	27.865	29.655	297.980	66.714
22	10/14/1999	143800	8.094	190.902	0.095	27.964	29.656	297.811	66.714
23	10/14/1999	143900	8.116	191.303	0.095	27.950	29.657	298.630	66.714
24	10/14/1999	144000	8.100	191.075	0.094	27.698	29.659	299.202	66.714
25	10/14/1999	144100	8.142	190.889	0.095	28.055	29.656	299.822	66.714
26	10/14/1999	144200	8.124	191.739	0.095	28.020	29.657	301.013	66.714
27	10/14/1999	144300	8.134	190.449	0.095	28.066	29.656	297.669	66.714
28	10/14/1999	144400	8.125	189.993	0.095	28.052	29.655	294.282	66.714
29	10/14/1999	144500	8.123	191.238	0.094	27.812	29.658	296.112	66.714
30	10/14/1999	144600	8.123	190.929	0.094	27.750	29.654	298.645	66.714
31	10/14/1999	144700	8.103	191.251	0.095	28.026	29.654	299.432	66.714
32	10/14/1999	144800	8.086	190.920	0.095	27.790	29.656	301.341	66.714
33	10/14/1999	144900	8.109	191.434	0.094	27.581	29.657	301.224	66.714
34	10/14/1999	145000	8.125	191.158	0.094	27.756	29.655	300.905	66.714
35	10/14/1999	145100	8.111	191.081	0.094	27.745	29.653	300.880	66.714
36	10/14/1999	145200	8.118	191.253	0.095	28.063	29.653	300.624	66.714
37	10/14/1999	145300	8.110	191.134	0.094	27.558	29.654	300.706	66.714
38	10/14/1999	145400	8.109	191.261	0.094	27.713	29.654	302.390	66.714
39	10/14/1999	145500	8.092	191.305	0.094	27.645	29.654	302.490	66.714
40	10/14/1999	145600	8.108	191.293	0.094	27.490	29.652	298.918	66.714
41	10/14/1999	145700	8.083	191.304	0.094	27.508	29.652	298.813	66.714
42	10/14/1999	145800	8.077	191.297	0.094	27.413	29.654	297.827	66.714
43	10/14/1999	145900	8.066	191.160	0.094	27.381	29.650	297.678	66.714
44	10/14/1999	150000	8.036	191.350	0.093	27.222	29.649	299.248	66.714
45	10/14/1999	150100	8.033	190.999	0.094	27.381	29.649	299.907	66.714
46	10/14/1999	150200	8.029	191.159	0.094	27.380	29.647	299.984	66.714
47	10/14/1999	150300	8.030	191.282	0.095	27.693	29.648	300.073	66.714
48	10/14/1999	150400	8.051	191.095	0.094	27.453	29.648	301.579	66.714
49	10/14/1999	150500	8.037	191.434	0.094	27.470	29.647	301.999	66.714
50	10/14/1999	150600	8.055	191.627	0.094	27.540	29.647	298.109	66.714
51	10/14/1999	150700	8.071	191.397	0.094	27.609	29.650	297.244	66.714
52	10/14/1999	150800	8.067	191.125	0.094	27.381	29.648	299.716	66.714
53	10/14/1999	150900	8.048	191.186	0.093	27.169	29.649	300.760	66.714
54	10/14/1999	151000	8.088	191.524	0.094	27.467	29.649	302.466	66.714
55	10/14/1999	151100	8.061	191.281	0.093	27.265	29.646	303.489	66.714
56	10/14/1999	151200	8.051	191.116	0.094	27.439	29.646	301.761	66.714
57	10/14/1999	151300	8.049	191.516	0.093	27.286	29.650	300.126	66.714
58	10/14/1999	151400	8.042	191.441	0.094	27.374	29.648	300.280	66.714

59	10/14/1999	151500	8.047	191.077	0.094	27.365	29.649	300.377	66.714
60	10/14/1999	151600	8.070	190.896	0.094	27.493	29.648	299.737	66.714
61	/ /								
62	/ /	AVE	8.076	191.172	0.095	27.731	29.654	299.448	66.714

APPENDIX C

FIELD DATA SHEETS

APPENDIX C - 1 UNCORRECTED REFERENCE METHOD DATA SHEETS

APPENDIX C - 1

UNCORRECTED REFERENCE METHOD DATA SHEETS

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2
09:05	12.42
09:06	12.45
09:07	12.46
09:08	12.48
09:09	12.47
09:10	12.48
09:11	12.52
09:12	12.53
09:13	12.52
09:14	12.49
09:15	12.50
09:16	12.49

AVERAGE VALUES FOR THE LAST 12 MINUTES

09:16	12.48

COMMENTS: O2 TRAVERSE
WEST PORT

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2
09:28	12.34
09:29	12.34
09:30	12.34
09:31	12.34
09:32	12.35
09:33	12.35
09:34	12.34
09:35	12.35
09:36	12.33
09:37	12.34
09:38	12.32
09:39	12.38

AVERAGE VALUES FOR THE LAST 12 MINUTES

09:39 12.34

COMMENTS: O2 TRAVERSE
SOUTH PORT

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2
10:22	12.31
10:23	12.35
10:24	12.32
10:25	12.33
10:26	12.32
10:27	12.34
10:28	12.33
10:29	12.33
10:30	12.31
10:31	12.28
10:32	12.31
10:33	12.53

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:33	12.34

COMMENTS: O2 TRAVERSE
EAST PORT

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2
10:22	12.31
10:23	12.35
10:24	12.32
10:25	12.33
10:26	12.32
10:27	12.34
10:28	12.33
10:29	12.33
10:30	12.31
10:31	12.28
10:32	12.31
10:33	12.53

AVERAGE VALUES FOR THE LAST 12 MINUTES

10:33	12.34

COMMENTS: O2 TRAVERSE
EAST PORT

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
11:50	11.89	26.8	17.5
11:51	11.89	27.0	17.7
11:52	11.89	26.8	17.6
11:53	11.90	27.0	17.7
11:54	11.91	27.1	17.8
11:55	11.89	26.9	17.6
11:56	11.90	26.9	17.6
11:57	11.90	26.9	17.6
11:58	11.90	27.2	17.8
11:59	11.89	26.9	17.6
12:00	11.89	26.7	17.5
12:01	11.89	26.7	17.5
12:02	11.89	27.1	17.8
12:03	11.89	27.0	17.7
12:04	11.89	26.7	17.5
12:05	11.89	27.1	17.8
12:06	11.88	26.7	17.5
12:07	11.88	26.7	17.5
12:08	11.89	26.8	17.6
12:09	11.89	27.2	17.8
12:10	11.88	27.3	17.9
12:11	11.87	27.1	17.7
12:12	11.89	27.1	17.7
12:13	11.89	27.3	17.9
12:14	11.86	26.6	17.4
12:15	11.97	26.4	17.4
12:16	11.93	26.8	17.6
12:17	11.89	26.6	17.4
12:18	11.88	26.4	17.3
12:19	11.88	26.8	17.5
12:20	11.91	27.2	17.8
12:21	11.87	26.8	17.5
12:22	11.87	27.0	17.7
12:23	11.89	27.2	17.8
12:24	11.89	27.3	17.9
12:25	11.89	27.2	17.8
12:26	11.87	27.2	17.8
12:27	11.88	27.2	17.8
12:28	11.88	27.2	17.8
12:29	11.87	27.2	17.8
12:30	11.88	27.4	17.9
12:31	11.87	26.9	17.6
12:32	11.87	27.0	17.6
12:33	11.88	27.3	17.9
12:34	11.89	27.2	17.8
12:35	11.86	26.9	17.5
12:36	11.87	27.2	17.7
12:37	11.86	26.9	17.5
12:38	11.87	27.2	17.7
12:39	11.85	26.8	17.5
12:40	11.87	27.0	17.7
12:41	11.87	27.1	17.7
12:42	11.86	27.0	17.6
12:43	11.86	26.9	17.6
12:44	11.87	26.9	17.5

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
12:45	11.85	26.9	17.6
12:46	11.86	27.0	17.6
12:47	11.85	26.9	17.5
12:48	11.88	27.1	17.7
12:49	11.87	27.1	17.7

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

12:49	11.88	27.0	17.7

COMMENTS: END RUN ONE

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
13:02	11.86	26.9	17.6
13:03	11.86	27.0	17.6
13:04	11.86	27.1	17.7
13:05	11.86	27.1	17.7
13:06	11.86	27.1	17.7
13:07	11.86	26.9	17.6
13:08	11.86	27.0	17.6
13:09	11.85	26.9	17.5
13:10	11.85	26.9	17.5
13:11	11.85	26.8	17.4
13:12	11.85	26.8	17.5
13:13	11.86	27.1	17.7
13:14	11.85	26.9	17.5
13:15	11.85	27.0	17.6
13:16	11.85	27.0	17.6
13:17	11.86	26.9	17.6
13:18	11.85	27.1	17.7
13:19	11.86	27.2	17.7
13:20	11.85	27.0	17.6
13:21	11.86	27.0	17.6
13:22	11.85	27.1	17.7
13:23	11.87	27.2	17.8
13:24	11.86	27.2	17.8
13:25	11.86	27.1	17.7
13:26	11.87	27.2	17.7
13:27	11.87	27.1	17.7
13:28	11.87	26.9	17.6
13:29	11.88	27.2	17.8
13:30	11.86	26.9	17.5
13:31	11.87	27.2	17.8
13:32	11.87	27.4	17.9
13:33	11.86	27.0	17.6
13:34	11.84	26.8	17.4
13:35	11.88	27.3	17.8
13:36	11.84	26.8	17.5
13:37	11.84	27.0	17.6
13:38	11.87	27.4	17.9
13:39	11.87	27.5	18.0
13:40	11.83	27.0	17.6
13:41	11.84	27.2	17.7
13:42	11.83	27.2	17.7
13:43	11.82	27.1	17.6
13:44	11.83	27.3	17.7
13:45	11.83	27.2	17.7
13:46	11.84	27.2	17.7
13:47	11.85	27.4	17.8
13:48	11.84	27.4	17.9
13:49	11.85	27.5	17.9
13:50	11.86	27.8	18.1
13:51	11.85	27.7	18.1
13:52	11.83	27.5	17.9
13:53	11.84	27.5	17.9
13:54	11.84	27.5	17.9
13:55	11.83	27.4	17.9
13:56	11.84	27.4	17.8

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
13:57	11.83	27.6	17.9
13:58	11.84	27.5	17.9
13:59	11.85	27.6	18.0
14:00	11.84	27.4	17.9
14:01	11.84	27.5	17.9

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

14:01	11.85	27.2	17.7

COMMENTS: END RUN TWO

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
14:17	11.84	27.9	18.2
14:18	11.84	28.1	18.3
14:19	11.85	28.3	18.4
14:20	11.85	28.2	18.4
14:21	11.85	28.2	18.4
14:22	11.85	28.2	18.4
14:23	11.85	28.0	18.2
14:24	11.84	28.0	18.2
14:25	11.84	28.1	18.3
14:26	11.83	28.0	18.2
14:27	11.85	28.2	18.4
14:28	11.85	28.2	18.4
14:29	11.85	28.2	18.4
14:30	11.83	28.0	18.3
14:31	11.85	28.2	18.4
14:32	11.83	28.2	18.3
14:33	11.83	28.3	18.4
14:34	11.83	28.0	18.2
14:35	11.83	28.0	18.2
14:36	11.84	28.1	18.3
14:37	11.82	28.0	18.2
14:38	11.83	28.0	18.2
14:39	11.83	27.9	18.2
14:40	11.83	28.1	18.3
14:41	11.84	28.1	18.3
14:42	11.82	28.0	18.2
14:43	11.83	28.1	18.3
14:44	11.83	27.9	18.1
14:45	11.84	28.1	18.3
14:46	11.84	28.1	18.3
14:47	11.84	28.0	18.2
14:48	11.84	27.9	18.2
14:49	11.84	28.1	18.3
14:50	11.85	28.1	18.3
14:51	11.83	27.8	18.1
14:52	11.85	28.0	18.3
14:53	11.84	27.9	18.2
14:54	11.83	27.9	18.2
14:55	11.83	27.8	18.1
14:56	11.84	27.7	18.0
14:57	11.85	27.9	18.2
14:58	11.82	27.7	18.0
14:59	11.85	28.1	18.3
15:00	11.84	28.0	18.2
15:01	11.85	28.3	18.4
15:02	11.83	28.0	18.2
15:03	11.82	28.1	18.2
15:04	11.83	28.1	18.3
15:05	11.83	28.3	18.4
15:06	11.81	27.9	18.1
15:07	11.81	27.7	18.0
15:08	11.81	27.9	18.1
15:09	11.80	27.8	18.0
15:10	11.80	27.8	18.0
15:11	11.82	27.8	18.1

POLK POWER STATION NOX BACT STUDY 10-14-1999

TIME	CHAN 3 STACK %O2	CHAN 6 STACK ppmNOX	STACK ppmNOX @15%O2
15:12	11.83	27.9	18.1
15:13	11.83	28.1	18.3
15:14	11.82	28.0	18.2
15:15	11.84	28.2	18.3
15:16	11.84	28.3	18.4

AVERAGE VALUES FOR THE LAST HOUR: 60 MINUTES OF VALID DATA

15:16	11.83	28.0	18.2

COMMENTS: END RUN THREE

APPENDIX D

SAMPLING EQUIPMENT CALIBRATIONS

APPENDIX D-1 LINEARITY CALIBRATIONS

APPENDIX D-2 DRIFT ASSESSMENT CALS

APPENDIX D-3 CYLINDER GAS CERTIFICATION

APPENDIX D-4 CONVERTER EFFICIENCY RESULTS

APPENDIX D-1
LINEARITY CALIBRATIONS

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: DAILY DIRECT CALIBRATION

DATE : 10-14-1999 TIME: 06:50 - 07:13

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.04
3	STACK	%O2	11.96	12.06
3	STACK	%O2	23.10	23.18
6	STACK	ppmNOX	0.0	-1.2
6	STACK	ppmNOX	24.0	25.3
6	STACK	ppmNOX	48.5	50.0
6	STACK	ppmNOX	81.1	81.8

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: DAILY SYSTEM CALIBRATION

DATE : 10-14-1999 TIME: 08:45 - 08:54

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.03
3	STACK	%O2	11.96	12.14
3	STACK	%O2	23.10	23.08
6	STACK	ppmNOX	0.0	-0.3
6	STACK	ppmNOX	24.0	25.6
6	STACK	ppmNOX	48.5	49.7
6	STACK	ppmNOX	81.1	81.3

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: SYSTEM CAL REPEAT

DATE : 10-14-1999 TIME: 11:32 - 11:45

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.05
3	STACK	%O2	11.96	12.14
3	STACK	%O2	23.10	23.07
6	STACK	ppmNOX	0.0	0.7
6	STACK	ppmNOX	24.0	25.3
6	STACK	ppmNOX	48.5	48.9
6	STACK	ppmNOX	81.1	80.7

APPENDIX D-2
DRIFT ASSESSMENT CALS

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: POST-O2 TRAVERSE CAL

DATE : 10-14-1999 TIME: 10:37 - 10:47

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.03
3	STACK	%O2	11.96	12.12
6	STACK	ppmNOX	0.0	2.6
6	STACK	ppmNOX	24.0	27.1

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 10/14/99

RUN NUMBER: 1

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	INITIAL VALUES			FINAL VALUES		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	0.7	0.00	1.2	0.50	0.50
NOx UP-SCALE	25.3	25.3	0.00	25.4	0.10	0.10
O2 LOW GAS	0.05	0.05	0.00	0.02	-0.12	-0.12
O2 UP-SCALE	12.14	12.14	0.00	12.10	-0.16	-0.16

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNT 1 BACT STUDY

TEST DATE: 10/14/99

RUN NUMBER: 1

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.05	0.05	0.00	0.02	-0.12	-0.12
O2 UP-SCALE	12.14	12.14	0.00	12.10	-0.16	-0.16

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \text{ X 100}$$

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: RUN ONE DRIFT CAL

DATE : 10-14-1999 TIME: 12:49 - 12:54

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.02
3	STACK	%O2	11.96	12.10
6	STACK	ppmNOX	0.0	1.2
6	STACK	ppmNOX	24.0	25.4

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 10/14/99

RUN NUMBER: 2

SPAN VALUES: 100 ppm NOx
25 % Oxygen

		-----INITIAL VALUES-----		-----FINAL VALUES-----		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	1.2	0.50	2.0	1.30	0.80
NOx UP-SCALE	25.3	25.4	0.10	25.8	0.50	0.40
O2 LOW GAS	0.05	0.02	-0.12	0.02	-0.12	0.00
O2 UP-SCALE	12.14	12.10	-0.16	12.09	-0.20	-0.04

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNT 1 BACT STUDY

TEST DATE: 10/14/99

RUN NUMBER: 2

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.05	0.02	-0.12	0.02	-0.12	0.00
O2 UP-SCALE	12.14	12.10	-0.16	12.09	-0.20	-0.04

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: RUN TWO DRIFT CAL

DATE : 10-14-1999 TIME: 14:02 - 14:08

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.02
3	STACK	%O2	11.96	12.09
6	STACK	ppmNOX	0.0	2.0
6	STACK	ppmNOX	24.0	25.8

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNIT 1 BACT STUDY

TEST DATE: 10/14/99

RUN NUMBER: 3

SPAN VALUES: 100 ppm NOx
25 % Oxygen

	INITIAL VALUES			FINAL VALUES		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
NOx ZERO GAS	0.7	2.0	1.30	2.9	2.20	0.90
NOx UP-SCALE	25.3	25.8	0.50	26.6	1.30	0.80
O2 LOW GAS	0.05	0.02	-0.12	0.03	-0.08	0.04
O2 UP-SCALE	12.14	12.09	-0.20	12.08	-0.24	-0.04

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE} - \text{ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE} - \text{INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

SYSTEM CALIBRATION BIAS AND DRIFT CALCULATIONS

SOURCE: POLK POWER STATION UNT 1 BACT STUDY

TEST DATE: 10/14/99

RUN NUMBER: 3

SPAN VALUE: 25 % Oxygen

	------INITIAL VALUES------			------FINAL VALUES------		
	ANALYZER CAL. RESPONSE	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	SYSTEM CAL. RESPONSE	SYSTEM CAL. BIAS (% OF SPAN)	DRIFT (% OF SPAN)
O2 ZERO GAS	0.05	0.02	-0.12	0.03	-0.08	0.04
O2 UP-SCALE	12.14	12.09	-0.20	12.08	-0.24	-0.04

$$\text{SYSTEM CAL. BIAS} = \frac{\text{SYSTEM CAL. RESPONSE - ANALYZER CAL. RESPONSE}}{\text{SPAN}} \times 100$$

$$\text{DRIFT} = \frac{\text{FINAL SYSTEM CAL. RESPONSE - INITIAL CAL. RESPONSE}}{\text{SPAN}} \times 100$$

CALIBRATION SUMMARY

SOURCE: POLK POWER STATION NOX BACT STUDY

REASON: RUN THREE DRIFT CAL

DATE : 10-14-1999 TIME: 15:16 - 15:21

A/D CHAN	MONITOR DESCRIPTION	UNITS	GAS VALUE	MONITOR RESPONSE
3	STACK	%O2	0.00	0.03
3	STACK	%O2	11.96	12.08
6	STACK	ppmNOX	0.0	2.9
6	STACK	ppmNOX	24.0	26.6

CONTINUOUS EMISSIONS MONITORING SET-UP

SOURCE: POLK POWER STATION NOX BACT STUDY

DATE: 10-13-1999 TIME: 12:08

A/D CHAN	DESCRIP	UNITS	SPAN	INPUT VOLTAGE	ZERO OFFSET
3	STACK	%O2	25	1.00 V	0%
6	STACK	ppmNOX	100	10.00 V	0%

AVERAGING PERIODS: ONE HOUR,

DILUTION CORRECTION 1: ppmNOX at 15% O2 STACK

C = (ppmNOX)(5.9/20.9 - %O2)

ppmNOX from A/D Channel 6
%O2 from A/D Channel 3

APPENDIX D-3
CYLINDER GAS CERTIFICATION

UMRUEEL

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: E-N31293
Project No.: 12-32332-014

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM045301 Certification Date: 2/08/99 Exp. Date: 2/07/2001
Cylinder Pressure***: 1940 PSIG

COMPONENT	CERTIFIED CONCENTRATION		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	24.0	PPM	+/- 1%	NIST
NITROGEN - OXYGEN FREE		BALANCE		
NOX	24.9	BALANCE		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2629	4/09/99	ALM067006	21.48 PPM	NITRIC OXIDE

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
HORIBA/CLA53A/850658093	02/08/99	CHEMILUMINESCENT

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis — Second Triad Analysis — Calibration Curve

NITRIC OXIDE

First Triad Analysis

Date: 02/01/99	Response Unit: PPM	
Z1=0.0500	R1=21.580	T1=24.100
R2=21.510	Z2=0.0300	T2=23.990
Z3=0.0300	T3=24.010	R3=21.620
Avg. Concentration:	23.97	PPM

Second Triad Analysis

Date: 02/08/99	Response Unit: PPM	
Z1=0.1900	R1=21.400	T1=24.050
R2=21.410	Z2=0.1600	T2=24.040
Z3=0.1600	T3=24.010	R3=21.410
Avg. Concentration:	24.09	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.999990

Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

Special Notes:

APPROVED BY: Greg T Bartlett
G BARTNETT

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ANALYSIS: Interference-Free™ EPA Protocol Gas

Customer	Assay Laboratory	
TAMPA ELECTRIC CO		Project No.: 12-29096-001
		P.O. No.: N31923
5010 CAUSEWAY BLVD	SCOTT SPECIALTY GASES	
	1750 EAST CLUB BLVD	
TAMPA,FL 33619	DURHAM,NC 27704	

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1993.

Cylinder Number: ALM049879 **Certification Date:** 6/09/98 **Exp. Date:** 6/09/2000
Cylinder Pressure*:** 1934 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**
NITRIC OXIDE	48.47 PPM	+/- 1% NIST Traceable
OXIDES OF NITROGEN	49.3 PPM	Reference Value
NITROGEN - OXYGEN FREE	BALANCE	

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 1684	4/03/99	ALM065500	99.80 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	LAST DATE CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	05/26/98	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date: 06/02/98	Response Unit: PPM	
Z1=0.2635	R1=99.772	T1=48.421
R2=99.768	Z2=0.1417	T2=48.510
Z3=0.2299	T3=48.526	R3=99.860
Avg. Concentration:	48.49	PPM

Second Triad Analysis

Date: 06/09/98	Response Unit: PPM	
Z1=0.2992	R1=99.842	T1=48.564
R2=99.860	Z2=0.1898	T2=48.433
Z3=0.3443	T3=48.399	R3=99.698
Avg. Concentration:	48.47	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

Special Notes:

ANALYST: B.M. Becton
B.M. Becton

RATA CLASS CES-HARD-3

Scott Specialty Gases

Dual-Analyzed Calibration Standard

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: Interference Free™ EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N31923
Project No.: 12-35046-001

Customer

TAMPA ELECTRIC CO

5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM019127 Certification Date: 7/19/99 Exp. Date: 7/18/2001
Cylinder Pressure***: 1994 PSIG

COMPONENT	CERTIFIED CONCENTRATION (Moles)		ANALYTICAL ACCURACY**	TRACEABILITY
NITRIC OXIDE	81.13	PPM	+/- 1%	Direct NIST and NMi
NITROGEN - OXYGEN FREE		BALANCE		
TOTAL OXIDES OF NITROGEN	81.82	PPM		Reference Value Only

*** Do not use when cylinder pressure is below 150 psig.
** Analytical accuracy is based on the requirements of EPA Protocal procedure G1, September 1997.
Product certified as +/- 1% analytical accuracy is directly traceable to NIST or NMI standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM1683	4/03/03	ALM020566	48.90 PPM	NO/N2

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
FTIR System/8220/AAB9400252	07/15/99	Scott Enhanced FTIR

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

NITRIC OXIDE

First Triad Analysis

Date:07/12/99	Response Unit:PPM	
Z1=0.1222	R1=48.911	T1=80.909
R2=48.792	Z2=-0.077	T2=81.157
Z3=0.1565	T3=81.343	R3=48.996
Avg. Concentration:	81.14	PPM

Second Triad Analysis

Date: 07/19/99	Response Unit: PPM	
Z1=0.2335	R1=48.805	T1=81.051
R2=48.938	Z2=-0.005	T2=81.173
Z3=0.1145	T3=81.120	R3=48.957
Avg. Concentration:	81.11	PPM

Calibration Curve

Concentration=A+Bx+Cx2+Dx3+Ex4	
r=0.999990	
Constants:	A=0.000000
B=1.000000	C=0.000000
D=0.000000	E=0.000000

APPROVED BY: BMB
B.M. Becton

CEO NILM 1

RATA CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: N31923
Project No.: 12-33126-001

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: ALM020393 **Certification Date:** 3/11/99 **Exp. Date:** 3/11/2002

Cylinder Pressure*:** 2015 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	11.96 %	+/- 1%	NIST
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

Product certified as +/- 1% analytical accuracy is directly traceable to NIST standards.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2658	1/02/01	ALM031884	9.680 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/16804-02	02/22/99	GC / TCD

ANALYZER READINGS

(Z=Zero Gas R=Reference Gas T=Test Gas r=Correlation Coefficient)

First Triad Analysis | Second Triad Analysis | Calibration Curve

OXYGEN

Date: 03/11/99	Response Unit: AREA	
Z1=0.0000	R1=247696	T1=306452
R2=248148	Z2=0.0000	T2=306564
Z3=0.0000	T3=306567	R3=248251
Avg. Concentration:	11.96	%

Concentration=A+Bx+Cx2+Dx3+Ex4
r=0.99999

Constants:	A=0.00
B=1.00	C=0.00
D=0.00	E=0.00

Special Notes:

APPROVED BY: B. M. Becton
B.M. BECTON

COMPLIANCE CLASS

Dual-Analyzed Calibration Standard

Scott Specialty Gases

1750 EAST CLUB BLVD,DURHAM,NC 27704 Phone: 919-220-0803 Fax: 919-220-0808

CERTIFICATE OF ACCURACY: EPA Protocol Gas

Assay Laboratory

SCOTT SPECIALTY GASES
1750 EAST CLUB BLVD
DURHAM,NC 27704

P.O. No.: EN31293
Project No.: 12-32820-001

Customer

TAMPA ELECTRIC CO
RAY MCDARBY
5010 CAUSEWAY BLVD
TAMPA FL 33619

ANALYTICAL INFORMATION

This certification was performed according to EPA Traceability Protocol For Assay & Certification of Gaseous Calibration Standards; Procedure #G1; September, 1997.

Cylinder Number: AAL15873 **Certification Date:** 2/23/99 **Exp. Date:** 2/22/2002

Cylinder Pressure*:** 2000 PSIG

COMPONENT	CERTIFIED CONCENTRATION	ANALYTICAL ACCURACY**	TRACEABILITY
OXYGEN	23.1 %	+/- 2%	NIST
NITROGEN	BALANCE		

*** Do not use when cylinder pressure is below 150 psig.

** Analytical accuracy is inclusive of usual known error sources which at least include precision of the measurement processes.

REFERENCE STANDARD

TYPE/SRM NO.	EXPIRATION DATE	CYLINDER NUMBER	CONCENTRATION	COMPONENT
NTRM 2659	1/02/01	ALM031720	20.72 %	OXYGEN

INSTRUMENTATION

INSTRUMENT/MODEL/SERIAL#	DATE LAST CALIBRATED	ANALYTICAL PRINCIPLE
VARIAN/3400/16804-02	02/22/99	GC / TCD

Dil #2

Special Notes:

APPROVED BY: B. M. Becton
B.M. BECTON

APPENDIX D-4
CONVERTER EFFICIENCY RESULTS

TECO
TAMPA ELECTRIC

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

TO: Quality Assurance File

FROM: R.A. Mc Darby

DATE: 27, August, 1999

SUBJECT: NO2 to NO Converter Efficiency Test
40 CFR 60, Appendix A, Method 20
Section 5.6
Analyzer S/N 10A/R-22525-205

The following results detail the performance of the converter efficiency test on analyzer S/N 10A/R-22525-205:

Highest value recorded during the 30 minute test run =	61.4 ppm
Value recorded at the end of the 30 minute test run =	61.4 ppm
Percent of decrease =	0.0 %

These results indicate that the converter currently installed in the referenced analyzer meets the requirements of 40 CFR 60, Appendix A, Reference Method 20, Section 5.6.

In accordance with the instructions contained in 40 CFR 60, Appendix A, Reference Method 20, sub-section 5.6.1; A sample was prepared using gas cylinder S/N ALM-019127 (certificate attached), diluted approximately 1:1 with 20.9% purified air. The sample was introduced into the analyzer through the sample port, and allowed to run for 30 minutes (12:26 – 12:56).

Raymond A. Mc Darby
Senior Environmental Technician
Corporate Environmental Services
Air Services

APPENDIX E

PROJECT PARTICIPANTS

TEST PARTICIPANTS

Corporate Environmental Services

Craig Coronado	Associate Technician
David Smith	Senior Environmental Technician

Environmental Planning

Shannon Todd	Engineer

Polk Power Station

David Knapp	Environmental and Safety Engineer

TAMPA ELECTRIC

RECEIVED

SEP 29 1999

BUREAU OF AIR REGULATION

September 28, 1999

Mr. A. A. Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7925 0192 2558
Via Facsimile

Re: Tampa Electric Company (TEC)
Polk Power Station
Petcoke Test Burn Authorization

1050233-002-AC
PSD-FL-194C

Dear Mr. Linero:

I have enclosed a Waiver of 90-Day Time Limit for Issuance of Permit. This waiver will start at the end of the current waiver, which will expire on October 1, 1999, and will extend the Waiver of 90-Day Time Limit to October 31, 1999. Thank you for your assistance in this matter. If you have any questions, please feel free to telephone me at (813) 641-5210.

Sincerely,

Patrick L. Shell
Engineer
Environmental Planning

EP\gm\PLS131

Enclosure

cc: S. Arif, BAR

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

WAIVER OF ~~90~~ 30 DAY TIME LIMIT FOR ISSUANCE OF PERMIT
UNDER SECTIONS 120.60(1) and 403.0876, FLORIDA STATUTES

Applicant: TAMPA ELECTRIC COMPANY

DEP File No.: 1050233-002-AC; PSD-FL-194C; PA92-32

With regard to the above referenced permit application, the applicant hereby, with full knowledge and understanding of its rights under Sections 120.60(1) and 403.0876, Florida Statutes, waives the right under those statutes to have the application for a permit issued or denied by the State of Florida Department of Environmental Protection within the ninety day time period prescribed by law. Said waiver is made freely and voluntarily by the applicant, is in its self-interest, and is made without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Protection.

This waiver shall expire on OCTOBER 31, 1999.

The undersigned is authorized to make this waiver on behalf of the applicant.

9/28/99
Signature/Date

JAMES HUNTER, ADMINISTRATOR-AIR PROGRAMS
Name/Title (please print)

Rev. June 1998

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
James Hunter, Admin
Air Program, EP
Tampa Electric Co
PO Box 111
Tampa, Fl
33601-0111

4a. Article Number
P 265 659 310

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

7. Date of Delivery
OCT - 4 1999

5. Received By: *(Print Name)*

6. Signature: *(Addressee or Agent)*
X

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

Thank you for using Return Receipt Service.

PS Form **3811,** December 1994 102595-98-B-0229 Domestic Return Receipt

P 265 659 310

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

Sent to James Hunter	
Street & Number TECO	
~~Post Office~~, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	9-28-99
Syngas Comb. Turbine	

PS Form **3800**, April 1995

Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

September 29, 1999

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. J. James Hunter
Administrator - Air Program
Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Tampa Electric Company (TEC)- Polk Power Station
Permit BACT Determination for Syngas Combustion Turbine

Dear Mr. Hunter:

The Department received your request of August 31, 1999, to preclude TEC from performing specified NO_x testing as required by the Title V Permit (#1050233-001-AV), PSD Permit (PSD-FL-194) and Conditions of Certification (PA 92-32). The testing was required to develop enough data based on which the Department can lower the recommended BACT emissions for NO_x of 25 ppmvd @ 15 percent oxygen, if the data supported that.

The specific condition requiring this testing was arrived at after thorough discussions during the initial permitting phase. The Department will still require TEC to fulfill the requirement of conducting additional tests, and to give an opportunity for Department personnel to be present during testing. Your letter of September 8, 1999 indicates that the initial NO_x emission test will be conducted on October 5, 1999. If this date is changed , please notify the Department of the reasons for delay and provide the future date when the initial NO_x test will take place.

If there are any questions regarding this matter, please call Mr. Syed Arif, P.E. at (850) 921-9528.

Sincerely,

9/29

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

AAL/sa/a

cc: Jerry Kissel, SWD
Rick Kirby, EPCHC

TAMPA ELECTRIC

RECEIVED

OCT 01 1999

BUREAU OF AIR REGULATION

September 28, 1999

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Via Fed Ex
Airbill No. 7917 9659 6227

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine

Dear Mr. Fancy:

In accordance with the Polk Power Station Title V Permit (#1050233-001-AV), TEC was tentatively scheduled to perform the initial NO_x BACT Determination test on October 5, 1999. However, on October 5, 1999, the unit will be running on distillate oil. Therefore, the test has been rescheduled to October 14, 1999. If you have any questions, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\SKT116

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

TAMPA ELECTRIC

RECEIVED
SEP 13 1999
BUREAU OF AIR REGULATION

September 8, 1999

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

Via Fed Ex
Airbill No. 8132 1667 7688

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine

1050233-003-AC
PSD-FI-194(d)

Dear Mr. Fancy:

Please find enclosed the test protocol for the Polk Power Station NO_x BACT Determination study. This study is being performed in accordance with the Polk Power Station Title V Permit (#1050233-001-AV), PSD (PSD-FL-194), and Conditions of Certification (PA 92-32), and is intended to quantify NO_x emissions from the combustion turbine while operating on syngas. The enclosed test protocol is intended to satisfy Specific Condition A.49 of the Polk Power Station Title V permit which states:

"The combustion turbine shall be operated for 12 to 18 months after the demonstration period... as described in the previous specific condition. During this period, NO_x emissions testing will be performed on the turbine at a regular interval of every two months. The Department shall be provided with the test protocol, including a time schedule, 15 days prior to the initial test. The permittee will provide the Department the emissions test results 30 days after the test is performed. These results are not for compliance purposes. The Department shall be notified and the reasons provided if a scheduled test is delayed or canceled.."

At this time, TEC plans to perform the initial NO_x emission test on October 5, 1999, but this date is subject to change based on unit operation, resource availability and/or equipment availability. If you have any questions, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

Enclosure

EP\gm\SKT114

c/enc: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

Memorandum

Florida Department of
Environmental Protection

TO: Hamilton Oven, P.E. Administrator
DEP, Power Plant Siting Office

FROM: Jeff Koerner, New Source Review Section JK
DEP, DARM - Bureau of Air Regulation

DATE: September 16, 1999

SUBJECT: TECO Power Services
Hardee Power Station, Unit 2B
75 MW Simple Cycle Combustion Turbine Project (PSD-FL-140A)

I received and approved a request from the applicant to make some very minor changes to the following specific conditions in Section III of Draft Permit No. PSD-FL-140A.

#4. Revised to clarify that a revised BACT analysis is necessary which may require the submittal of a full PSD permit application. Also included the appropriate rule citation.

#10. Revised to clarify that maintenance and tuning of the unit is to be in accordance with the manufacturer's recommended schedule.

#16.(b) Added "corrected to 15% oxygen" for the CO limit which was inadvertently omitted.

#39. Added the capability of maintaining records in an electronic format that could be printed at the Department's request.

I have attached the complete revised pages so that they may be inserted into the original permit intact. The revisions are italicized and date of revision is included in the header. All of these changes are very minor and will be revised in the Department's Final Permit. The applicant published the PSD Public Notice in The Tampa Tribune on September 4, 1999. The 30-day PSD public comment period will expire on October 3, 1999. I have attached a copy of the Public Notice provided by the applicant.

Please contact me at 414-7268 if you have any questions.

JFK

Attachments

4. Simple Cycle Operation Only: *The combustion turbine shall operate only in simple cycle mode. This requirement is based on the permittee's request which formed the basis of the NOx BACT determination and resulted in the emission standards specified in this permit. Specifically, the NOx BACT determination eliminated several control alternatives based on technical considerations and costs due to the elevated temperatures of the exhaust gas. Any request to convert this unit to combined cycle operation by installing a new heat recovery steam generator or connecting this unit to an existing heat recovery steam generator shall require the permittee to perform a new, current NOx BACT analysis and the approval of the Department through a permit modification. The results of this analysis may validate the initial BACT determination or result in the submittal of a full PSD permit application, new control equipment, and new emissions standards.* [Rule 62-212.400(6)(b), F.A.C.]

5. Allowable Fuels: The combustion turbine shall be fired by pipeline natural gas containing no more than 2 grains of sulfur per 100 dry standard cubic feet of gas. As a backup fuel, the combustion turbine may be fired with No. 2 distillate oil (or a superior grade) containing no more than 0.05% sulfur by weight. Compliance with limits on fuel sulfur content shall be demonstrated by the record keeping requirements and/or the conditions of the Alternate Monitoring Plan specified in this permit. It is noted that these limitations are much more stringent than the NSPS sulfur dioxide limitation and assure compliance with 40 CFR 60.333 and 60.334. [Applicant Request, Rule 62-210.200, F.A.C. (Definition - Potential Emissions)]

6. Hours of Operation: The hours of operation of the combustion turbine are not limited when firing natural gas (8760 hours per year). The combustion turbine shall not fire low sulfur distillate oil for more than 876 hours during any consecutive 12 months. Operation below 50% of baseline operation shall be limited to two (2) hours per unit cycle (breaker open to breaker closed). The permittee shall install, calibrate, operate and maintain fuel flow meters to measure and accumulate the amount of each fuel fired in the combustion turbine. [Applicant Request; Rule 62-212.400, F.A.C. (BACT); Rule 62-210.200, F.A.C. (Definitions - Potential Emissions)]

7. Operating Procedures: The Best Available Control Technology (BACT) determinations established by this permit rely on "good operating practices" to minimize emissions. Therefore, all operators and supervisors shall be properly trained to operate and maintain the combustion turbine and pollution control devices in accordance with the guidelines and procedures established by each equipment manufacturer. The training shall include good operating practices as well as methods of minimizing excess emissions. [Applicant Request; Rule 62-4.070(3); Rule 62-212.400, F.A.C. (BACT)]

8. Plant Operation - Problems: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the owner or operator shall notify the Compliance Authority as soon as possible, but at least within one (1) working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; the steps being taken to correct the problem and prevent future recurrence; and where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit and the regulations. [Rule 62-4.130, F.A.C.]

EMISSIONS CONTROLS

9. Automated Control System: In accordance with the manufacturer's recommendations, the permittee shall install, calibrate, tune, operate, and maintain the General Electric Speedtronic™ Gas Turbine Control System. This system shall be designed and operated to monitor and control the gas turbine combustion process and operating parameters including, but not limited to: fuel distribution and staging, turbine speed, load conditions, combustion temperatures, water injection, and fully automated startup, shutdown, and cool-down. [Design; Rule 62-4.070(3); Rule 62-212.400, F.A.C. (BACT)]

10. Combustion Controls: The owner and operators shall employ "good operating practices" in accordance with the manufacturer's recommended operating procedures to control CO, NOx, and VOC emissions. Prior to the required initial emissions performance testing, the combustion turbine, dry low-NOx (DLN) combustors, and Speedtronic™ control system shall be tuned to optimize the reduction of CO, NOx, and VOC emissions. Thereafter, these systems shall be maintained and tuned *in accordance with the manufacturer's recommendations*. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

11. DLN Combustion Technology: To control NOx emissions when firing natural gas, the permittee shall install, tune, operate and maintain dry low-NOx (DLN) combustors on the combustion turbine. The permittee shall provide manufacturer's emissions performance versus load diagrams for the specific DLN system prior to commencement of operation. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

12. Water Injection: To control NOx emissions when firing low sulfur distillate oil, the permittee shall install, calibrate and operate an automated water injection system. This system shall be maintained and adjusted to provide the minimum NOx emissions possible by water injection. The permittee shall provide manufacturer's emissions performance versus load diagrams for the specific water injection system prior to commencement of operation. [Design, Rules 62-4.070 and 62-212.400, F.A.C.]

13. Circumvention: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]

14. Unconfined Particulate Emissions: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

EMISSIONS STANDARDS

15. Emissions Standards Summary: The following table summarizes the emissions standards determined by the Department. These standards or the equivalents are provided in the specific permit conditions.

EU-004: GE Model 7EA Combustion Turbine		
Pollutant	**Controls[b]**	**Emission Standard**
CO	Gas Firing W/DLN, First 12 Months After Initial Startup	25.0 ppmvd @ 15% oxygen 54.0 pounds per hour
	Gas Firing W/DLN, After First 12 Months After Initial Startup	20.0 ppmvd @ 15% oxygen 43.0 pounds per hour
	Oil Firing W/Wet Injection	20.0 ppmvd @ 15% oxygen 43.0 pounds per hour
NOx	Gas Firing W/DLN	9.0 ppmvd @ 15% oxygen 32.0 pounds per hour
	Oil Firing W/Wet Injection	42.0 ppmvd @ 15% oxygen 167.0 pounds per hour
PM/PM10	Fuel Sulfur Specifications and Combustion Design	Visible emissions ≤ 10% opacity (PM estimated at 0.002 grains/dscf)
SAM[a]/SO2	Natural Gas Sulfur Specification	2 grain per 100 SCF of gas
	Low Sulfur Distillate Oil Sulfur Specification	0.05% sulfur by weight
VOC[a]	Gas Firing W/Combustion Design	2.0 ppmvd as methane 2.0 pounds per hour
	Oil-Firing W/Combustion Design	4.0 ppmvd as methane 5.0 pounds per hour

[a] The VOC and SAM standards are synthetic (PSD) minor limits - not BACT limits.
[b] DLN means dry low-NOx controls. Oil firing is limited to 876 hours during any consecutive 12 months.

16. Carbon Monoxide (CO)

(a) **Gas Firing:** During the first 12 months after initial startup, CO emissions shall not exceed 54.0 pounds per hour nor 25.0 ppmvd corrected to 15% oxygen based on a 3-hour test average when firing natural gas in the combustion turbine. Thereafter, CO emissions shall not exceed 43.0 pounds per hour nor 20.0 ppmvd corrected to 15% oxygen based on a 3-hour test average when firing natural gas in the combustion turbine.

(b) **Oil Firing**: When firing low sulfur distillate oil in the combustion turbine, CO emissions shall not exceed 43.0 pounds per hour nor 20.0 ppmvd *corrected to 15% oxygen* based on a 3-hour test average.

The permittee shall demonstrate compliance with these standards by conducting tests in accordance with EPA Method 10 and the performance testing requirements of this permit. [Rule 62-212.400, F.A.C. (BACT)]

17. Nitrogen Oxides (NOx)

(a) **Gas Firing**: When firing natural gas in the combustion turbine, NOx emissions shall not exceed 32.0 pounds per hour nor 9.0 ppmvd corrected to 15% oxygen based on a 3-hour test average. In addition, NOx emissions shall not exceed 9.0 ppmvd corrected to 15% oxygen based on a 24-hour block average for data collected from the continuous emissions monitor.

(b) **Oil Firing**: When firing low sulfur distillate oil in the combustion turbine, NOx emissions shall not exceed 167.0 pounds per hour nor 42.0 ppmvd corrected to 15% oxygen based on a 3-hour test average. In addition, NOx emissions shall not exceed 42.0 ppmvd corrected to 15% oxygen based on a 3-hour block average for data collected from the continuous emissions monitor.

NOx emissions are defined as emissions of oxides of nitrogen measured as NO_2. The permittee shall demonstrate compliance by conducting tests in accordance with EPA Methods 7E, 20 and the performance testing requirements of this permit. Compliance with the 3-hour and 24-hour block averages shall be demonstrated by collecting and reporting data in accordance with the conditions for the NOx continuous emissions monitor specified by this permit. [Rule 62-212.400, F.A.C. (BACT)]

18. Particulate Matter (PM/PM_{10}), Sulfuric Acid Mist (SAM) and Sulfur Dioxides (SO_2)

(a) **Fuel Specifications**: Emissions of PM, PM_{10}, SAM, and SO_2 shall be limited by the good combustion techniques and the fuel sulfur limitations specified in this permit. The permittee shall demonstrate compliance with the fuel sulfur limits by maintaining records of the sampling and analysis required by this permit and/or as specified in the provisions of the Alternate Monitoring Plan. [Rule 62-212.400, F.A.C. (BACT)]

(b) **VE Standard**: As a surrogate for PM/PM_{10} emissions, visible emissions from the operation of the combustion turbine shall not exceed 10% opacity, based on a 6-minute average. The permittee shall demonstrate compliance with this standard shall by conducting tests in accordance with EPA Method 9 and the performance testing requirements of this permit. [Rule 62-212.400, F.A.C. (BACT)]

19. Volatile Organic Compounds (VOC)

(a) **Gas Firing**: When firing natural gas in the combustion turbine, VOC emissions shall not exceed 2.0 pounds per hour nor 2.0 ppmvd based on a 3-hour test average.

(b) **Oil Firing**: When firing low sulfur distillate oil in the combustion turbine, VOC emissions shall not exceed 5.0 pounds per hour nor 4.0 ppmvd based on a 3-hour test average.

(a) The NOx CEM data may be used in lieu of the monitoring system for water-to-fuel ratio and the reporting of excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG. Subject to EPA approval, the calibration of the water-to-fuel ratio-monitoring device required in 40 CFR 60.335(c)(2) will be replaced by the 40 CFR 75 certification tests of the NOx CEMS.

(b) The NOx CEM data shall be used in lieu of the requirement for reporting excess emissions in accordance with 40 CFR 60.334(c)(1), Subpart GG.

(c) When requested by the Department, the CEMS emission rates for NOx on this unit shall be corrected to ISO conditions to demonstrate compliance with the NOx standard established in 40 CFR 60.332.

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

(1) The permittee shall apply for an Acid Rain permit within the deadlines specified in 40 CFR 72.30.

(2) The permittee shall submit a monitoring plan, certified by signature of the Authorized Representative, that commits to using a primary fuel of pipeline supplied natural gas containing no more than 2 grains of sulfur per 100 SCF of gas pursuant to 40 CFR 75.11(d)(2);

(3) Each unit shall be monitored for SO_2 emissions using methods consistent with the requirements of 40 CFR 75 and certified by the USEPA.

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

[40 CFR 60, Subpart GG, Applicant Request]

39. Monthly Operations Summary: By the fifth calendar day of each month, the owner or operator shall record the following information in a written *(or electronic)* log for the previous month of operation: the amount of hours each fuel was fired; the quantity of each fuel fired; the calculated average heat input of each fuel fired in mmBTU per hour, based on the lower heating value; and the average sulfur content of each fuel. In addition, the owner or operator shall record the hours of oil firing for the previous 12 months of operation. The Monthly Operations Summary shall be maintained on site in a legible format available for inspection *or printed* at the Department's request. [Rule 62-4.160(15), F.A.C.]

REPORTS

40. Emissions Performance Test Reports: A report indicating the results of the required emissions performance tests shall be submitted to the Compliance Authority no later than 45 days after completion of the last test run. The test report shall provide sufficient detail on the tested emission unit and the procedures used to allow the Department to determine if the test was properly conducted and if the test results were properly computed. At a minimum, the test report shall provide the applicable information listed in Rule 62-297.310(8)(c), F.A.C. [Rule 62-297.310(8), F.A.C.].

41. Excess Emissions Reporting: If excess emissions occur due to malfunction, the owner or operator shall notify the Compliance Authority within (1) working day of: the nature, extent, and duration of the excess emissions; the cause of the excess emissions; and the actions taken to correct the problem. In

RECEIVED
SEP 07 1999
TECO Power Services

THE TAMPA TRIBUNE

RECEIVED

Published Daily

Tampa, Hillsborough County, Florida

SEP 09 1999

BUREAU OF AIR REGULATION

State of Florida }
County of Hillsborough } ss.

Before the undersigned authority personally appeared J. Rosenthal, who on oath says that she is Classified Billing Manager of The Tampa Tribune, a daily newspaper published at Tampa in Hillsborough County, Florida; that the attached copy of advertise[illegible] nt being a

LEGAL NOTICE

in the matter of

PUBLIC NOTICE OF INTENT

was published in said newspaper in the issues of

SEPTEMBER 4, 1999

Affiant further says that the said The Tampa Tribune is a newspaper published at Tampa in said Hillsborough County, Florida, and that the said newspaper has heretofore been continuously published in said Hillsborough County, Florida, each day and has been entered as second class mail matter at the post office in Tampa, in said Hillsborough County, Florida for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that she has neither paid nor promised any person, this advertisement for publication in the said newspaper.

J. Rosenthal

Sworn to and subscribed before me, this 7 day

of SEPTEMBER, A.D. 1999

Personally Known____or Product Identification______

Type of Identification Produced________________

(SEAL)

Susie Lee Slaton

OFFICIAL NOTARY SEAL
SUSIE LEE SLATON
COMMISSION NUMBER
CC639424
MY COMMISSION EXP.
APRIL 16, 2001

NOTARY PUBLIC ★ STATE OF FLORIDA

PUBLIC NOTICE OF INTE
TO ISSUE PSD PERMI
STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL PROT
TION
DEP File No. PSD-FL-140
PPS No. PA89-25
TECO Power Services
Hardee Power Station Uni
Hardee County

The Department of Envi
mental Protection (Dep
ment) gives notice of its in
to issue a permit under
requirements for the Prev
tion of Significant Deteri
tion (PSD) of Air Quality
TECO Power Services.
permit is to install one Ge
al Electric Model No. PG
7EA dual-fuel simple c
combustion turbine with e
trical generator set havin
nominal power productio
75 MW. The new unit will
the existing infrastructure
cluding oil storage [illegible]
port equipment. [illegible]
Rule 62-212.400, F.A.C. and
CFR 52.21, a Best Avail
Control Technology (BA
determination was requi
for carbon monoxide (CO)
trogen oxides (NOx), part
late matter (PM/PM10), su
dioxide (SO2). Dry low-N
(DLN) combustion technol
will be used to control ni
gen oxide emissions when
ing the primary fuel of p
line natural gas. Water in
tion will be used to con
nitrogen oxide emissi
when firing low sulfur di
late oil as a backup fuel fo
to 876 hours per year. C
bustion design and clean f
will be used to minimize er
sions of carbon monox
particulate matter, sulfu
acid mist; sulfur dioxide,
volatile organic compou
The applicant's name and
dress are: Richard E. Ludv
President and Authori
Representative, TECO Pov
Services; 702 North Fran
Street, Tampa, FL 33602.
Based on the permit appl
tion and Department's BA
determination, the maxim
pollutant emissions from
combustion turbine (in t
per year) are summarized
low.

Pollutant	Project Poten Emissi	PSD Significant Emiss R
CO (First 12 months)	237	
CO (After First 12 Months)	188	
NOx	199	
PM10	50	
SO2	44	
VOC	10	

An air quality impact analy
was conducted. Maxim
predicted impacts due to p
posed emissions from the p
ject are less than the appli
ble PSD Class I and Clas
signification impact levels.
The Department will acc
written comments and
quests for a public hear
(meeting) concerning the p
posed permit issuance act

NO_x Emission Test Protocol
For
Syngas Fired HRSG Combustion Turbine
At

Polk Power Station

Mulberry, Florida

Prepared for
Tampa Electric Company
By
Corporate Environmental Services
Of
Tampa Electric Company

September 8, 1999

TAMPA ELECTRIC

Rec'd 13 Sept. '99

1050233-003-AC
PSD-FL-194(d)

Introduction

In conjunction with the issuance of the Polk Power Station Title V permit, Tampa Electric Company is required to perform bimonthly NO_x emissions testing on the combustion turbine for the purpose of determining the Best Available Control Technology (BACT) for NO_x. Specifically, condition A.49 states that:

> *"The combustion turbine shall be operated for 12 to 18 months after the demonstration period (estimated to be from October 1, 1999 until April 1, 2001) as described in the previous specific condition. During this period, NO_x emission testing will be performed on the turbine at a regular interval of every two months. The Department shall be provided with the test protocol, including a time schedule, 15 days prior to the initial test. The permittee will provide the Department the emissions test results 30 days after the test is performed. These results are not for compliance purposes. The Department shall be notified and the reasons provided if a scheduled test is delayed or canceled."*

The intent of this document is to satisfy condition A.49 of the Polk Power Station Title V permit by providing the testing protocol and an estimated schedule of the required testing.

Facility Description

Source:	Polk unit 1 is a 192 MW combined cycle combustion turbine with a Heat Recovery Steam Generator that will be tested to determine the Best Available Control Technology (BACT) for Nitrogen Oxide (NO_x) emissions. This unit is fueled on Syngas produced through a coal slurry gasification process and uses Nitrogen injection for the control of NO_x.
Location:	Polk Power Station is located approximately 13 miles south of Mulberry on SR 37, in Polk County, Florida.
Regulation:	USEPA NO_x BACT Determination under new source standards.
Test Coordinator:	Corporate Environmental Services (CES) Tampa Electric Company

Proposed Testing Schedule

The testing is tentatively scheduled to begin on October 5, 1999 and is subject to change based on unit operation, resource availability and/or equipment availability. Once begun, testing will continue bimonthly for a period of 12 to 18 months as required by the Title V permit.

Testing Protocol

1) Gaseous Emission Test Matrix & Gas Sample Strategy
   A) Three test runs will be performed with the unit operating at base load. The average of the three runs will be used for reporting purposes. The unit will be operated at the normal maximum load available on the day of the test.
   B) Gaseous emission test runs will be a minimum of 1 hour in duration.
   C) Exhaust gas sampling will be collected at the lowest O_2 measurement point as dictated by Reference Method 20.
   D) Syngas fuel sample collection will be clean pressurized syngas prior to the combustion turbine for each sample run.

2) Turbine Exhaust Gas Measurements – A transportable laboratory grade analyzer system (TCEMS) will be used with continuous monitors capable of measuring NO_x and O_2. Each analyzer will be calibrated in the field and QA/QC procedures will be performed as required by each EPA test method. Following initial calibrations of the equipment, a sample of exhaust gas will be continuously extracted from the exhaust stack and delivered to each individual analyzer at the same flow rate as used for instrument calibration. The results of these measurements will be recorded on a portable personal computer to document the sample analysis, calibrations and quality assurance activities conducted during the tests. All results are stored on the hard drive and printed on a dot matrix printer.

   A) EPA Method 3A for O_2

   O_2 will be measured using a Servomex 1400B Oxygen analyzer, which measures the paramagnetic susceptibility of the sample gas by means of a magneto-dynamic type measuring cell. The O_2 will be measured on a dry basis and will be used to establish a sample reference location during the O_2 traverse. The O_2 will also be used as a diluent measurement to determine the correction of NO_x to 15% O_2.

   B) EPA Method 20 for NO_x

   NO_x will be measured using a Thermo Environmental 10 A/R NO/NO_x analyzer that uses the measurement technique of chemiluminescence. The NO_x concentration is also measured on a dry basis. The 300 ppmv span value listed in Subpart GG, 40 CFR 60, is not appropriate for the expected 25 ppmv NO_x emission rate. Therefore a 100 ppmv span value will be substituted.

C) Ambient Conditions. The following data will be collected during each test run to allow correction of the NO_x emission to ISO day conditions for comparison to the Subpart GG emission standard.

1) Temperature in °F
2) Barometric pressure in inches of Hg.
3) Humidity

3) Operational data will be provided by Polk Power Station to document the unit's operating parameters during the test. The test data will be collected from the control instrumentation for each test run in one minute averages.

A) Fuel flow rate in ft^3/sec.
B) N_2 flow rate in ft^3/sec.
C) CT load in megawatts generated.

4) Gaseous Samples Quality Assurance/Quality Control

A) Zero and span calibration drift checks before and after each test run. Test run validated by $\pm$ 3% drift from full scale response. Emission concentration measurements corrected for zero and span drift.
B) NO_x analyzer NO_2 to NO converter efficiency check results to verify a minimum 90% converter efficiency.
C) Calibration gases traceable to EPA Protocol 1 and the National Institute of Standards and Technology.
D) Multi-point instrument calibration error test $\pm$ 2% linearity check.
E) Sample system bias check before each series of tests to $\pm$ 5% of span.
F) All sampling and analysis conducted on site with on-site results.

Enclosures:
Reference of Permit Requirements
Sample System Diagrams
Source Location Diagram

15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard, and the resulting maximum allowable emission rate for the emissions unit, plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rules 62-213.440 and 62-297.310(8), F.A.C.]

Miscellaneous Requirements.

A.47. Definitions. For the purposes of Rule 62-204.800(7), F.A.C., the definitions contained in the various provisions of 40 CFR 60, shall apply except that the term "Administrator" when used in 40 CFR 60, shall mean the Secretary or the Secretary's designee.
[40 CFR 60.2; and, Rule 62-204.800(7)(a), F.A.C.]

A.48. Circumvention. No owner or operator subject to the provisions of 40 CFR 60 shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.
[40 CFR 60.12]

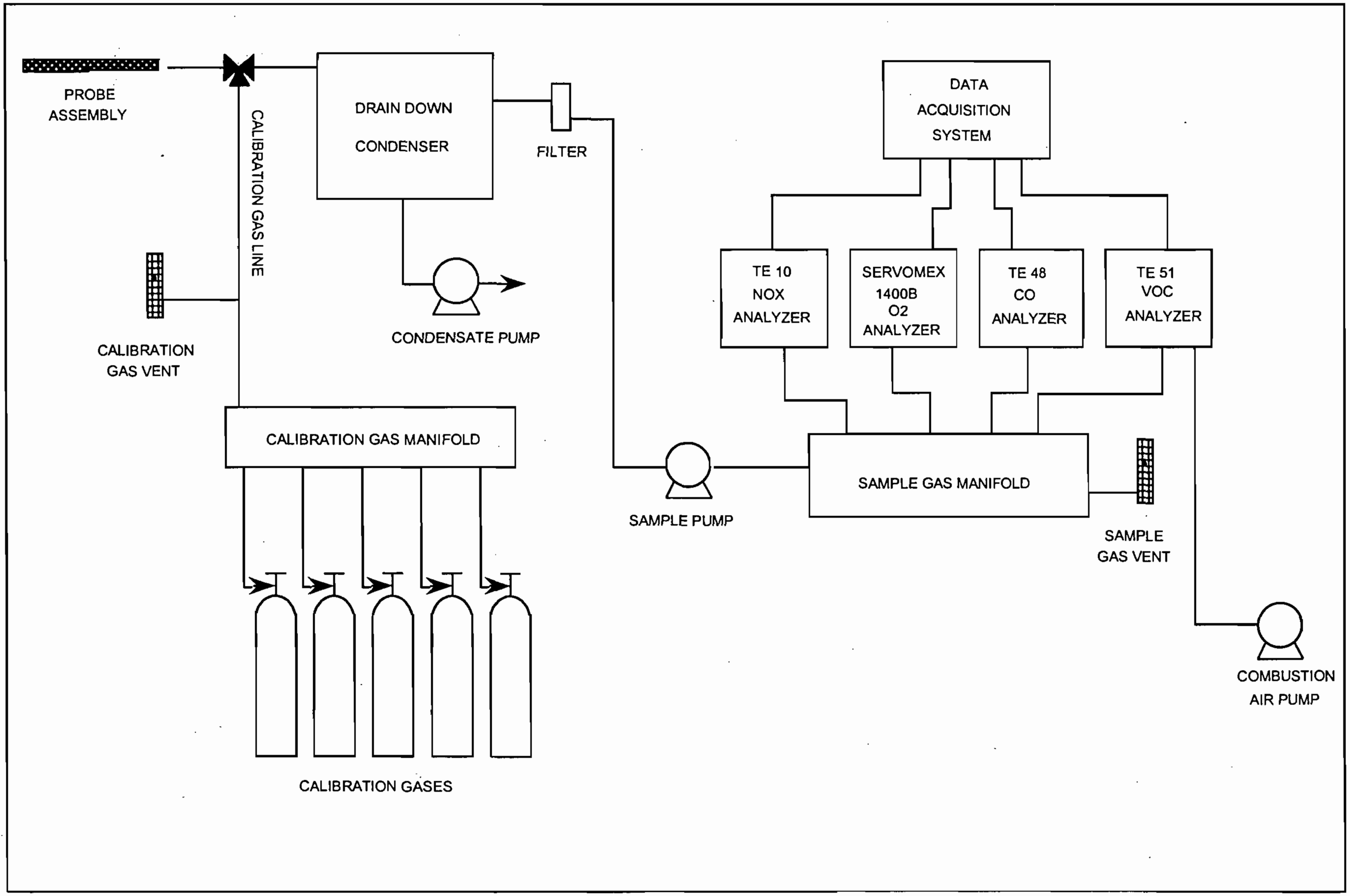
A.49. The combustion turbine shall be operated for 12 to 18 months after the demonstration period (estimated to be from Mid-1998 until December 31, 1999) as described in the previous specific condition. During this period, NO_X emission testing will be performed on the turbine at a regular interval of every two months. The Department shall be provided with the test protocol, including a time schedule, 15 days prior to the initial test. The permittee will provide the Department the emissions test results 30 days after the test is performed. These results are not for compliance purposes. The Department shall be notified and the reasons provided if a scheduled test is delayed or canceled.
[PSD-FL-194]

A.50. One month after the test period ends (estimated to be by February, 2000), the permittee shall submit to the Department a NO_X recommended BACT Determination as if it were a new source, using the data gathered on this facility, other similar facilities and the manufacturer's research. The Department will make a determination of BACT for NO_X only and adjust the NO_X emission limits accordingly.
[PSD-FL-194]

A.51. Sulfur Content of Fuel. The maximum sulfur content of the low sulfur fuel oil shall not exceed 0.05 percent, by weight. Compliance shall be demonstrated in accordance with the requirements of 40 CFR 60.334 by testing for sulfur content of the fuel oil in the storage tanks once per day when firing oil. Testing for fuel oil heating value shall also be conducted on the same schedule. See specific condition **A.8.**
[PSD-FL-194]

A.52. The continuous opacity monitor shall be utilized for purposes of periodic monitoring, only.
[Applicant agreement with EPA on January 22, 1999]

A.53. During syngas firing, the SO_2 emission rate shall be monitored by the CEM for purposes of periodic monitoring.
[Applicant agreement with EPA on January 22, 1999]

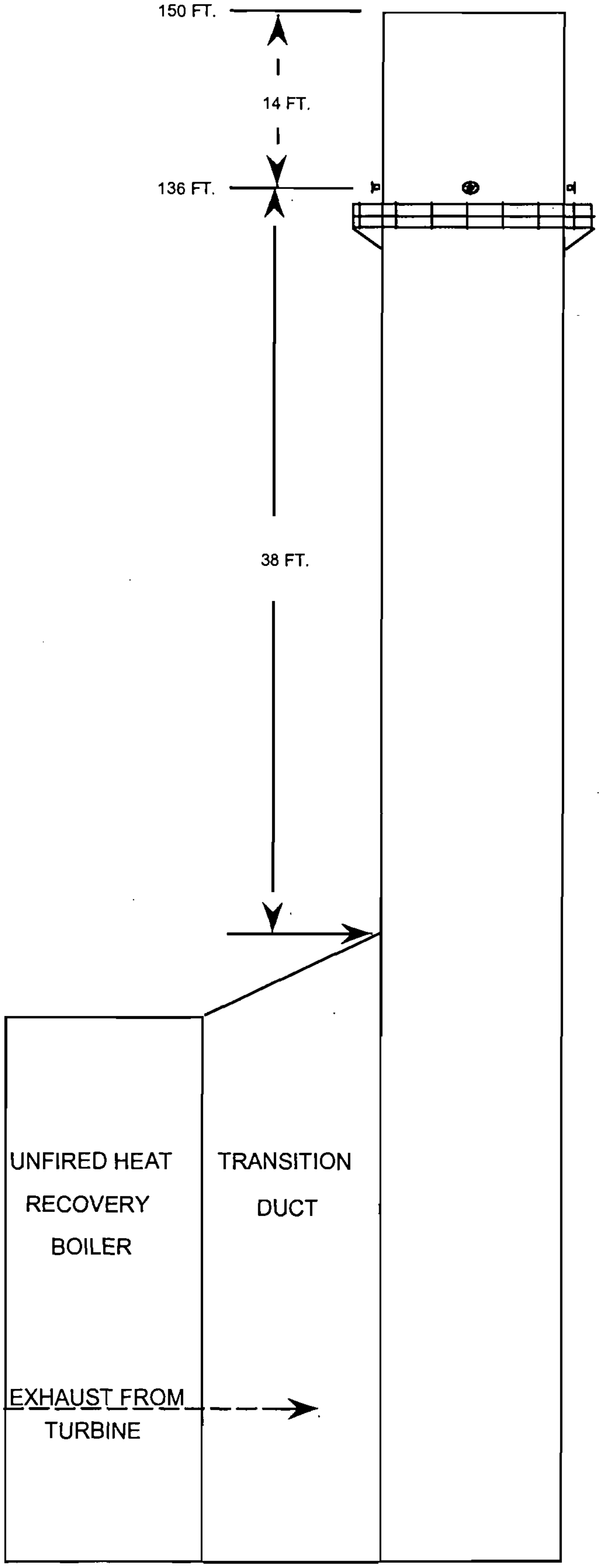


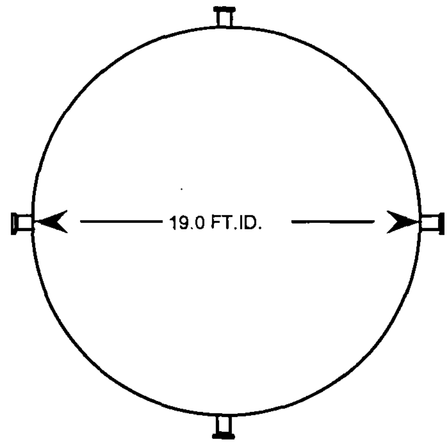
TECO
TAMPA ELECTRIC

Carbon Monoxide and Nitrogen Oxide Sampling Trains

USEPA METHODS 3A, 10, 20, 25 CEM SYSTEM LAYOUT

POLK POWER STATION
COMBUSTION TURBINE
COMBINED CYCLE UNIT
TEST LOCATION





PORT LOCATION PLAN

STACK DIAMETERS DOWNSTREAM
FROM DISTURBANCE = 2.0

STACK DIAMETERS UPSTREAM
FROM DISTURBANCE = 0.7

STACK DIAMETER = 19.0 FT.

STACK AREA = 283.529 SQ. FT.
STACK AREA =40828.138 SQ. IN.

EXTRACTIVE
TRAVERSE
POINTS

1 - 3.65"
2 - 11.17"
3 - 19.38"
4 - 28.50"
5 - 38.53"
6 - 50.16"
7 - 64.52"
8 - 85.50"

ADD 13" PORT LENGTH
TO POINTS

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TAMPA ELECTRIC

TAMPA ELECTRIC

August 31, 1999

RECEIVED
SEP 07 1999
BUREAU OF AIR REGULATION

Mr. Clair Fancy
Florida Department of Environmental Protection
2600 Blair Stone Road
Twin Towers Office Building
Tallahassee, Florida 32399-2400

1050233-003-AC
PSD-FL-194d

Re: Tampa Electric Company (TEC) – Polk Power Station Title V Permit BACT Determination for Syngas Combustion Turbine

Dear Mr. Fancy:

In conjunction with the Polk Power Station Title V Permit (#1050233-001-AV), PSD (PSD-FL-194), and Conditions of Certification (PA 92-32) TEC is required to perform bimonthly NO_x testing on the combustion turbine for a period of 12 to 18 months following the demonstration period, which will expire September 30, 1999. Condition A.50 of the Title V Permit states:

> *"One month after the test period ends... the permittee shall submit to the Department a NO_x recommended BACT Determination as if it were a new source, using the data gathered on this facility, other similar facilities and the manufacturer's research."*

TEC feels that sufficient data already exists to submit a NO_x recommended BACT Determination for the syngas combustion turbine in lieu of performing the specified testing.

Facility Data

Polk Unit 1 is a 192 MW combined cycle combustion turbine with a heat recovery steam generator. Syngas is produced through a coal slurry gasification process and fed to the combustion turbine where it is utilized as the primary fuel.

While operating on syngas, the combustion turbine emits approximately 18-20 ppm NO_x @ 15% O_2, which is controlled via nitrogen injection prior to combustion. Over the course of a year, however, this rate varies depending on ambient weather, fuel characteristics and operational parameters. Consequently, TEC feels that a NO_x emission limit of 25 ppm will provide the necessary regulatory flexibility to ensure efficient operation while satisfying the BACT Determination requirement of the Title V permit.

Similar Facility Data

Wabash River Station in Vigo County, Indiana is the only other facility in the nation that operates a permitted syngas combustion turbine identical to the unit at Polk Power Station. The BACT Determination for this facility was 25 ppm NO_x @ 15% O_2. Syngas containing about 2.0-mol % nitrogen is used as fuel at this facility compared to syngas containing about 3.5-mol % nitrogen at Polk Power

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111
AN EQUAL OPPORTUNITY COMPANY
HTTP://WWW.TAMPAELECTRIC.COM
(813) 228-4111
CUSTOMER SERVICE:
HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

Station. Since the fuel used at Polk Power Station contains more fuel bound nitrogen, NO_x emissions are higher as a result of combustion. Therefore, TEC must employ more effective NO_x controls to achieve the same NO_x reductions that are being seen at Wabash River Station. In light of this as well as the fact that Wabash River Station and Polk Power Station operate identical combustion turbines, TEC feels that a NO_x limit of 25 ppm is appropriate for the Polk Power Station facility.

Manufacturer's Research

In early 1997, General Electric hired Cubix Corporation to perform base load emissions testing on the combustion turbine. The result of this testing showed an average NO_x concentration of 19.7 ppm @ 15% O_2. However, due to low ambient temperatures and the cooling effect of nitrogen injection, NO_x emissions typically increase during the winter months. Therefore, TEC feels that 25 ppm is an appropriate limit to allow for fluctuation in seasonal operating parameters and still operate the unit efficiently.

Conclusion

Tampa Electric Company feels that NO_x emissions data collected from both Polk Power Station and Wabash River Station supports the position that a NO_x BACT Determination limit of 25 ppm @ 15% O_2 is appropriate for the combustion turbine at Polk Power Station. Tampa Electric has based this conclusion on data from annual compliance tests, data from Wabash River Station as well as manufacturer's research and feels that additional data collection through testing is not necessary. Therefore, Tampa Electric requests that the Department review this issue and agree that a NO_x emission limit of 25 ppm @ 15% O_2 while operating on syngas is an appropriate limit for above referenced unit. If you have any questions or concerns, please feel free to contact me at (813) 641-5033.

Sincerely,

J. James Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\SKT112

c: Mr. Al Linero - FDEP
Mr. Syed Arif - FDEP
Mr. Jerry Kissel - FDEP SW
Mr. Rick Kirby - EPCHC

TECO

TAMPA ELECTRIC

RECEIVED

JAN 19 1999

BUREAU OF
AIR REGULATION

January 18, 1999

A. A. Linero, P.E..
Administrator, New Source Review Section
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 808009420600
Via Facsimile

Re: Tampa Electric Company (TEC)
Polk Power Station
Petcoke Test Burn Authorization

1050233-002-AC

Dear Mr. Linero:

I have enclosed a Waiver of 90 Day Time Limit for Issuance of Permit. This waiver is dated to expire on October 1, 1999. Thank you for your assistance in this matter. If you have any questions, please feel free to telephone me at (813) 641-5210.

Sincerely,

Jamie Hunter
Administrator - Air Programs
Environmental Planning

EP\gm\PLS118

Enclosure

cc: S. Arif

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111

(813) 228-4111

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OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

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STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

WAIVER OF 90 DAY TIME LIMIT FOR ISSUANCE OF PERMIT
UNDER SECTIONS 120.60(1) and 403.0876, FLORIDA STATUTES

Applicant: TAMPA ELECTRIC COMPANY

DEP File No.: 1050233-002-AC; PSD-FL-194C; PA92-32

With regard to the above referenced permit application, the applicant hereby, with full knowledge and understanding of its rights under Sections 120.60(1) and 403.0876, Florida Statutes, waives the right under those statutes to have the application for a permit issued or denied by the State of Florida Department of Environmental Protection within the ninety day time period prescribed by law. Said waiver is made freely and voluntarily by the applicant, is in its self-interest, and is made without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Protection.

This waiver shall expire on OCTOBER 1, 1999.

The undersigned is authorized to make this waiver on behalf of the applicant.

1/18/99
Signature/Date

JAMES HUNTER ADMINISTRATOR-AIR PROGRAMS
Name/Title (please print)

Rev. June 1998

5A

RECEIVED

NOV 11 1998

BUREAU OF
AIR REGULATION

TAMPA ELECTRIC

November 10, 1998

Mr. A. A. Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 808009421227

Re: Tampa Electric Company (TEC) 1050233-002-AC
Polk Power Station PSD-FL-194C
Petroleum Coke Test Burn Request Second Response to Incompleteness Issues

Dear Mr. Linero:

We hereby provide the following responses to comments raised in your letter of October 5, 1998 regarding TEC's request to burn Petcoke at the Polk Power Station. For ease of review, we have included your comments, followed by our corresponding responses.

FDEP Comment #1:

Attachment 1 of the response indicates sulfur content of the coal utilized in the past to be 2.83% while the material balance done in Attachment 2 for baseline coal reflects a higher percent sulfur feed. Please explain the discrepancy. The material balance should have been based on past actual sulfur content of the coal. Please redo the material balance based on 2.83 % sulfur in coal and then compare the emissions of SO_2 from the Acid Plant stack and the HRSG stack with petcoke blend fuel.

Tampa Electric Response:

The sulfur content listed in Attachment 1, the table labeled "Example of Baseline Coal Composition Illinois #6" is the sulfur content of coal on a <u>wet basis</u>. The mass balance in Attachment 2 was calculated on a <u>dry basis</u>. Therefore any comparison of the sulfur content in the mass balance (Attachment 2) to the 2.83% wet basis value (Attachment 1) must be corrected for moisture. For example, the following equation uses the dry fuel mass from the mass balance on Attachment 2 and corrects it to the wet fuel mass using 15.9% moisture.

$$\frac{180{,}417 \cdot lb \cdot DryFuel}{(1-0.159)\cdot \%Moisture} = 214{,}526 \cdot lb \cdot WetFuel$$

Now the sulfur content on a wet basis can be calculated using the SO_2 mass from column 1 of the mass balance for the baseline coal.

$$\frac{6{,}079 \cdot lb \cdot SO_2}{214{,}526 \cdot lb \cdot WetFuel} \times 100 = 2.83\%$$

This calculation shows that the two baseline coals are equivalent in sulfur content and that the mass balance was calculated with a 2.83% sulfur content coal.

FDEP Comment #2:

Please indicate if the facility baseline SO_2 emissions listed in Attachment 1 are based on actual stack test data. If it is based on actual stack test, provide information on how many tests were considered in arriving at 521 lb/hr SO_2 emissions.

Tampa Electric Response:

These emission rates are not from a stack test. The "facility" SO_2 emission rate is the addition of the "Acid Gas" and "HRSG Stack" emissions from the material balance projections and should add up to 522 lb/hr for the baseline and 512 lb/hr for the fuel blend.

FDEP Comment #3:

Please provide information on the ultimate use of slag. Explain the rationale for an increase of more than two-folds in the sulfur content of the slag when burning petcoke blend fuel. Also, indicate if the higher sulfur content of the slag will have any adverse affect to the environment.

Tampa Electric Response:

The intended use of slag from the Polk Power Station is sand blasting and roofing material. The sulfur that is removed with the slag is fixed in the carbon crystalline matrix and therefore rendered inert. Considering this intended use, Tampa Electric does not expect any adverse environmental impacts from the additional sulfur in the slag.

The rationale for the two-fold increase in sulfur content of the slag is industry knowledge of higher sulfur retention in petcoke blend slag. Because petcoke contains less volatile compounds than coal, it is expected to be more difficult to completely combust in the gasification process. The result is expected to be higher loss of ignition with the petcoke blend which will in turn will retain more sulfur.

The currently accepted value for sulfur retention in conventionally combusted slag is 5%. The assumption made in the petcoke blend mass balance is 10% sulfur retention. This is a reasonable assumption considering the expected amount of unburned carbon in the slag from the gasification of the petcoke.

FDEP Comment #4:

Please provide letter sealed by a Professional Engineer (P.E.) registered in the State of Florida and knowledgeable in the field of combustion and/or air pollution control certifying that the present control equipment at the facility is capable of handling the added sulfur due to petroleum coke. The letter should provide information on the present scrubbing capacity versus design of the control equipment. It should also provide information on the additional scrubbing capacity required for the burning of petcoke fuel blend...

Tampa Electric Response:

There will not be an increase in sulfur compound loading to the sulfuric acid plant, therefore there is no basis for this request. The loading of acid gas (H_2S) to the sulfuric acid plant is estimated to be 5,410 lb/hr for the petcoke blend as compared to 5556 lb/hr for the baseline coal.

I hope that this information satisfactorily answers your questions concerning the petcoke permit modification request. If you have any questions please contact Patrick Shell or me at (813) 641-5210.

Sincerely,

James Hunter
Administrator - Air
Environmental Planning

EP\gm\PLS107

cc: B. Oven, DEP
B. Thomas, SWD
Polk Co.
EPA
NPS
S. Arif, BAR

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. James Hunter, AEP
Tampa Electric Co.
P O Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 333 612 527

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

7. Date of Delivery
10-9-98

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
X

PS Form **3811**, December 1994 102595-97-B-0179 **Domestic Return Receipt**

Thank you for using Return Receipt Service.

Z 333 612 527

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

Sent to James Hunter	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Polk Power St. 10-7-98 PSD-FI-194D	

PS Form **3800**, April 1995

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

October 6, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. James Hunter, Administrator
Air Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Amendment of DEP File PSD-FL-194D
Polk Power Station

Dear Mr. Hunter:

The Department reviewed your letter dated September 21, 1998 requesting permission to install a carbonyl sulfide (COS) hydrolysis vessel upstream of the acid gas removal unit. It is our understanding that this change will result in the conversion of COS to hydrogen sulfide prior to the acid gas removal equipment and lower sulfur dioxide emissions from Polk Power Station Unit 1 combustion turbine. Because no emission increases are expected, the Department concurs with your decision and does not require any permit modifications.

Sincerely,

AA Lin 10/6

A.A. Linero, P.E. Administrator

New Source Review Section

AAL/sa

cc: Buck Oven, PPS
Bill Thomas, DEP SWD
Joe King, Polk County

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Mr. James Hunter
TECO
PO Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 333 612 524

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

7. Date of Delivery
10-7-98

5. Received By: *(Print Name)*

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

6. Signature: *(Addressee or Agent)*
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PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 612 524

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

Sent to	James Hunter
Street & Number	TECO
Post Office, State, & ZIP Code	Tampa Fl
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	10-5-98 1050233-002-AC PSD-Fl-194C

PS Form **3800**, April 1995

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

October 5, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. James Hunter
Administrator - Air
Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: DEP File No. 1050233-002-AC; PSD-FL-194C; PA-92-32
Polk Power Station

Dear Mr. Hunter:

The Department has received your response to incompleteness issues raised in our letter of March 26, 1998, to allow burning of coal/petroleum coke fuel blends as well as 100 percent coal as solid fuels for use in the Integrated Coal Gasification Combined Cycle (IGCC) combustion turbine during the demonstration period. Based on our review of your response, we have determined that additional information is needed in order to process the application. The following information is required:

1. Attachment 1 of the response indicates sulfur content of the coal utilized in the past to be 2.83% while the material balance done in Attachment 2 for baseline coal reflects a higher percent sulfur feed. Please explain the discrepancy. The material balance should have been based on past actual sulfur content of the coal. Please redo the material balance based on 2.83% sulfur in coal and then compare the emissions of SO_2 from the Acid Plant stack and the HRSG stack with the petcoke blend fuel.
2. Please indicate if the facility baseline SO_2 emissions listed in Attachment 1 are based on actual stack test data. If it is based on actual stack test, provide information on how many tests were considered in arriving at 521 lb/hr SO_2 emissions.
3. Please provide information on the ultimate use of slag. Explain the rationale for an increase of more than two-folds in the sulfur content of the slag when burning petcoke blend fuel. Also, indicate if the higher sulfur content of the slag will have any adverse affect to the environment.
4. Please provide a letter sealed by a Professional Engineer (P.E.) registered in the State of Florida and knowledgeable in the field of combustion and/or air pollution control certifying that the present control equipment at the facility is capable of handling the added sulfur due to

petroleum coke. The letter should provide information on the present scrubbing capacity versus design of the control equipment. It should also provide information on the additional scrubbing capacity required for the burning of petcoke fuel blend. The P.E. seal will "affirmatively provide the Department with reasonable assurance based on plans, test results, installation of control equipment, or other information, that the construction, expansion, modification, operation, or activity of the installation will not discharge, emit, or cause pollution in contravention of Department standards or rules." **Rules 62-4.050(3) and 62-4.070(1), F.A.C.**

The Department will resume processing this application after receipt of the requested information. If there are any questions regarding this matter, please call Syed Arif, P.E. at (850)921-9528.

Sincerely,

A.A. Linero 10/5

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

AAL/sa

cc: Buck Oven, DEP
Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD

TAMPA ELECTRIC

September 21, 1998

Mr. Clair Fancy, P. E.
Chief, Bureau of Air Quality Management
Florida Department of Environmental Protection
Twin Towers Office Building
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 805858542766

Re: Tampa Electric Company (TEC)
Polk Power Station
Request for Review

Dear Mr. Fancy:

TEC is requesting review of a proposed operational change at the Polk Power Station as required in permit condition Q of PA-92-32 and PSD-FL-194. TEC is requesting permission to install a carbonyl sulfide (COS) hydrolysis vessel upstream of the acid gas removal unit. This operational change will result in the conversion of COS to hydrogen sulfide prior to the acid gas removal equipment and reduced sulfur dioxide emissions from Polk Power Station Unit 1 combustion turbine. I have enclosed an attachment which further describes the purpose and the principle of operation of the COS hydrolysis vessel.

This change does not meet the definition of a modification as defined in Chapter 62-210.200 (188) since there is a decrease in SO_2 emissions and no expected increase in any other air pollutants. In addition, the change is also exempted from definition as a modification under 40CFR §60.14 (h). Since this change does not meet the requirements for a permit modification or revision in Chapter 62-213.400 F.A.C., TEC has not enclosed an application for permit modification.

The exact date of installation has not been established, but TEC will attempt to install this equipment prior to September 1999. Additional information on the installation date will follow as it becomes available.

I hope that this information is sufficient for your assessment and approval of this operational change. If you have any questions please contact Patrick Shell or me at (813) 641-5210.

Sincerely,

James Hunter
Administrator - Air
Environmental Planning

EP\gm\PLS105

Attachment

c: Buck Oven, FDEP (att)
Jerry Kissel, FDEP (att)

cc: S. Arif
Polk Co.
EPA
NPS

COS HYDROLYSIS

COS hydrolysis is the chemical reaction through which carbonyl sulfide (COS) is converted to hydrogen sulfide (H_2S):

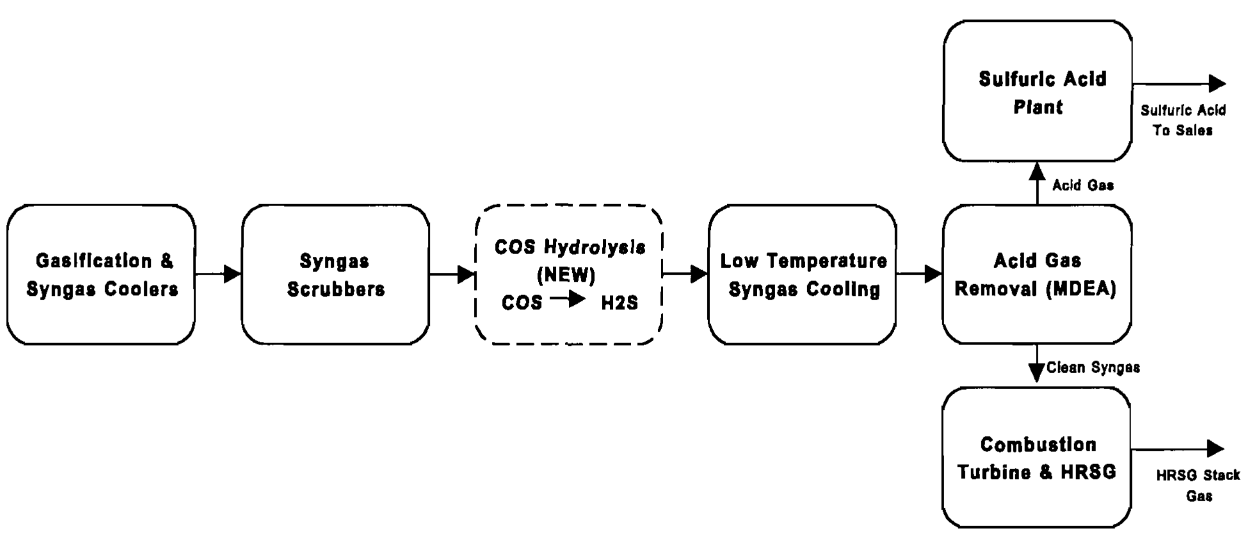
$$COS + H_2O \rightarrow H_2S + CO_2$$

The reaction is thermodynamically favored at lower temperatures, but a catalyst is required to achieve reasonable reaction rates at normal process temperatures (300°F to 400°F). Several common materials are effective COS hydrolysis catalysts.

The H_2S formed in the hydrolysis reaction is relatively easy to remove in most acid gas removal systems, but COS is not. Consequently, commercial COS hydrolysis systems are often used upstream of chemical synthesis processes which require removal of sulfur species from the feed stream because sulfur poisons many chemical reaction catalysts.

These conventional commercial COS hydrolysis systems typically consist of a catalyst filled reactor. The reactor is often preceded by a preheater and steam injection apparatus if the gas contains insufficient water vapor to promote the reaction. Additionally, commercial COS hydrolysis systems are often preceded by a bulk H_2S removal system, and followed by a final polishing H_2S removal system to remove the H_2S formed in the reactors.

At Polk Power Unit #1, most of the coal's sulfur appears in the synthesis gas (syngas) in the form of H_2S, but between 4% and 5% of it is in the form of COS. Like most acid gas removal systems, Polk's acid gas removal solvent (MDEA) removes over 99% of the H_2S from the syngas, but removes little if any of the COS. TEC proposes installing a simple COS hydrolysis system to convert 50% to 75% of the COS to H_2S. This H_2S would then be removed by the MDEA and converted to sulfuric acid in the sulfuric acid plant, thereby reducing total emissions.



Fold at line over top of envelope to

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- Complete items 1 and/or 2 for additional services.
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- Print your name and address on the reverse of this form so that we can return this card to you.
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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:
Gregory M. Nelson, PE
Tampa Electric Co.
P O Box 111
Tampa, Fl
33601-0111

4a. Article Number
Z 333 612 519

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

7. Date of Delivery
9-28-98

5. Received By: (*Print Name*)

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

6. Signature: (*Addressee or Agent*)
X

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

Thank you for using Return Receipt Service.

Z 333 612 519

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

Sent to Greg Nelson	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date PSD-FI-1943 9-24-98	

PS Form **3800**, April 1995

Department of Environmental Protection

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

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

September 18, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Administrator, Air Programs
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Modification of DEP File PSD-FL-194B
Polk Power Station

Dear Mr. Nelson:

The Department reviewed your letter and application dated February 24, 1998 and additional information submitted on June 11, 1998 requesting an extension of the demonstration period for integrated coal gasification and combined-cycle system and an extension of the time to submit a proposed BACT determination. This request is acceptable to the Department. Following publication of the Public Notice of the Intent to Issue dated July 31, the referenced permit is hereby modified as follows:

SPECIFIC CONDITION H.2.

The maximum allowable emissions from the IGCC combustion turbine, when firing syngas and No. 2 fuel oil during the ~~two~~ three year demonstration period (until September 30, 1999), shall not exceed the following:

(Note that the rest of this condition is related to applicable emissions and is not changed by this action)

SPECIFIC CONDITION H.6.

The combustion turbine will be operated for 12-18 months after the demonstration period (estimated to be from ~~Mid 1998~~ October 1, 1999 until ~~December 31, 1999~~ April 1, 2001).

(Note that the rest of this condition is related to testing requirements and is not changed by this action)

SPECIFIC CONDITION H.7.

One month after the test period ends (estimated to be by ~~February 2000~~ June 1, 2001), the permittee will submit to the Department a NO_X recommended BACT Determination as if it were a new source using data gathered on this facility, other similar facilities and the manufacturer's research. The Department will make a determination on the BACT for NO_X only and adjust the NO_X emission limits accordingly.

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes. Any party to this order (permit modification) has the right to seek judicial review of it under Section 120.68, F.S., by the filing of a Notice of Appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within (thirty) days after this Notice is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

for Howard L. Rhodes, Director
Division of Air Resources

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this PERMIT MODIFICATION was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 9-24-98 to the person(s) listed:

Greg Nelson, P.E.*
Doug Neeley, EPA
John Bunyak, NPS
Buck Oven, PPS
Bill Thomas, DEP SWD
Joe King, Polk County

Clerk Stamp

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

Kim Tober 9-24-98
(Clerk) (Date)

FINAL DETERMINATION

Tampa Electric Company
Polk Power Station

DEP File PSD-FL-194B

An Intent to Issue PSD permit modification for the Polk Power Station Integrated Gasification Combined Cycle Facility located at 9895 State Road 37 South, Mulberry, Polk County, was distributed on July 31, 1998. The Public Notice of Intent was published in the Lakeland Ledger on August 7, 1998. Copies of the draft PSD permit modification were available for public inspection at the Department offices in Tampa and Tallahassee.

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

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

Memorandum

Florida Department of
Environmental Protection

TO: Howard L. Rhodes Signed

THRU: Clair Fancy
Al Linero

FROM Syed Arif Syed Arif

DATE: September 18, 1998

SUBJECT: Tampa Electric Company, PSD-FL-194B

Attached for approval and signature is a PSD permit modification for Tampa Electric Company Integrated Gasification Combined Cycle Facility located in Mulberry, Florida. The modification will allow an extension of the demonstration period for gas cleaning technology from two to three years. The request will defer the hot gas cleanup demonstration (removal of sulfur from syngas prior to combustion) until the sorbent becomes commercially viable. The project is built with joint funding by Tampa Electric Company and Department of Energy.

Emissions of nitrogen oxides are controlled by the addition of nitrogen in the turbine combustion chamber which reduces the combustor flame temperature, thereby reducing the formation of NO_x in the fuel combustion process. Particulate matter is controlled by high efficiency cyclones.

The project modification provides reasonable assurance that all the requirements of the permit modification will be complied with.

I recommend your approval and signature.

TAMPA ELECTRIC

RECEIVED

SEP 09 1998

BUREAU OF
AIR REGULATION

September 8, 1998

Mr. A. A. Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 805858540167

Re: Tampa Electric Company (TEC)
Polk Power Station
Petcoke Test Burn

Dear Mr. Linero:

We hereby provide the following responses to comments raised in your letter of March 26, 1998 regarding TEC's request to burn Petcoke at the Polk Power Station. For ease of review, we have included your comments, followed by our corresponding responses.

FDEP Comment #1:

Please indicate based on the start-up of the unit your best estimate of the ending date for the demonstration period before the extension is granted.

TEC Response:

The Polk Power Station was placed in commercial operation on September 30, 1996. A copy of this notification letter is enclosed. The current demonstration period will end on September 30, 1998.

FDEP Comment #2:

Please provide the material balances for sulfur and associated SO_2 emissions with the burning of 25%, 50%, and 75% blend of petcoke which has a much higher sulfur content compared to coal.

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111
(813) 228-4111

CUSTOMER SERVICE:
HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

TEC Response:

Attachments 1 & 2 are provided for explanation of the material balances and associated SO2 emissions. Attachment 1 provides an estimation of the fuel blend composition and the estimated emissions. As alluded to in DEP's question three, the sulfur content of the coal is limited by the amount of Petcoke that will be blended with it. The coal and Petcoke blend will be blended to a sulfur content of 3.5% sulfur or less.

TEC has provided mass balances based on estimations of the control equipment's performance. The unit's control equipment performance may exceed the estimates made in this submittal. Therefore, TEC is requesting to test a petcoke blend at 5% increments above a 55% blend, if the 55% petcoke blend demonstrates emissions less than the baseline test.

Attachment 2 provides a material balance of the sulfur and mass flows and SO2 emissions associated with the gasification, acid gas removal, the sulfuric acid plant, and the combustion turbine processes. Two cases are provided, the Illinois #6 coal is representative of a coal that was previously used at the Polk facility. The second case is the estimated parameters associated with the combustion of the Petcoke blend. The coal blended with the Petcoke, Indiana #5, is representative of the coal that will be used in the test burn.

FDEP Comment #3:

Please indicate if any limitations were considered for the sulfur content of the coal for this project. If so, what was the limit considered either in the original application or during BACT discussions.

TEC Response:

The sulfur content of the coal for this project will be limited by the sulfur content of the petroleum coke as indicated in the attachments. Lower sulfur content fuel will be blended to compensate for the high sulfur content of the petroleum coke. The BACT determination made for the Polk Power Station, uses a coal with a maximum sulfur content of 3.05% and a minimum heating value of 11,035 Btu/LB, which corresponds to 5.3 LB SO2/MMBTU. The estimated maximum sulfur content of the fuel blend will be 5.1 LB SO2/MMBTU.

FDEP Comment #4:

Please provide reasonable assurance that the current sulfuric acid plant will be capable of handling the added sulfur due to petroleum coke. What are the emissions of SO2 from the sulfuric acid plant with the present set-up and what are the emissions expected when coal/petroleum coke blend is fired in IGCC?

TEC Response:

The loading rate of sulfur to the sulfuric acid plant will be similar to that previously demonstrated in operation of the facility as indicated in Attachment 2. TEC believes that the demonstration of compliance with similar sulfur loading to the control equipment provides reasonable assurance that the control equipment is capable of handling the sulfur in the petroleum coke blend. A comparison of acid plant emissions is made in the Attachment 2. Estimated SO2 emissions are 40 lb/hr for the present fuel use and 32 lb/hr for the petcoke fuel blend.

FDEP Comment #5:

Please provide the different scenarios under which testing will be done and the associated time periods for each scenario.

TEC Response:

Due to the complexity and the unique nature of the Polk's Clean Coal technology, TEC is requesting a year to complete the petcoke test burn. An estimated schedule of testing is provided below.

Date of Introduction of Fuel Blend: December 1, 1998

Testing Date:
Scenario: 55% Petcoke/ 45% Coal
Estimated date to begin testing: May 1, 1999

Scenario: 60% Petcoke/40% Coal (if 55% blend emissions are less than baseline)
Estimated date to begin testing: June 1, 1999

Scenario: 65% Petcoke/ 35% Coal (if 60% blend emissions are less than baseline)
Estimated date to begin testing: July 1, 1999

Scenario: 70% Petcoke/ 30% Coal (if 65% blend emissions are less than baseline)
Estimated date to begin testing: July 15, 1999

I hope that this information satisfactorily answers your questions concerning the petcoke permit modification request. If you have any questions please contact Patrick Shell or me at (813) 641-5210.

Sincerely,

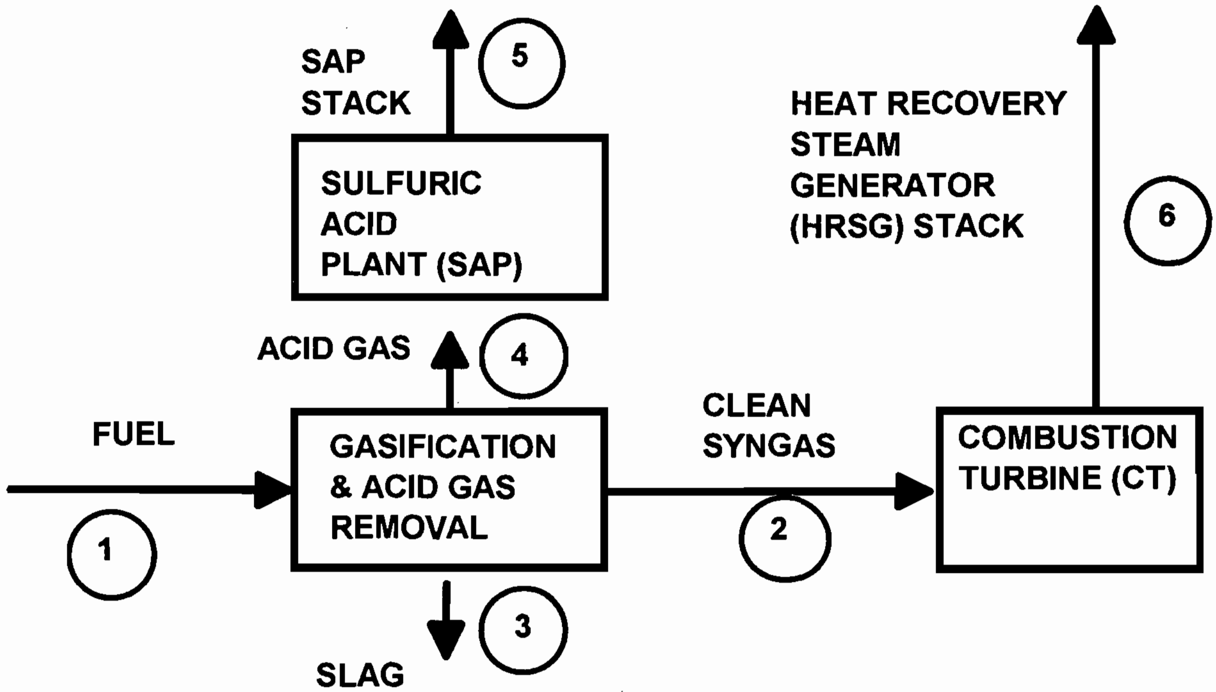
James Hunter
Administrator - Air
Environmental Planning

EP\gm\PLS104

Attachments

cc: EPA
NPS
SWD
B. Oven, PPS
S. Arif, BAR

ATTACHMENT 2



HEAT AND MATERIAL BALANCE PROJECTIONS
(55% Petroleum Coke, 45% Indiana #5 Coal)
(All Flow Rates in Lb/Hr)

Stream Number	**1**	**2**	**3**	**4**	**5**	**6**
Stream Description	**Fuel (Dry Basis)**	**Clean Syngas**	**Slag (Dry Basis)**	**Acid Gas**	**Acid Plant Stack**	**HRSG Stack**
(Example of Baseline Coal)						
Total Flow (LB/HR)	180417	351290	22570	19774	50877	3941450
Sulfur (LB/HR)	6079	241	283	5556	20	241
Sulfur (as SO2)(LB/HR)	n/a	n/a	n/a	n/a	40	482

Petroleum Coke Blend (55% Petroleum Coke, 45% Indiana #5 Coal)						
Total Flow (LB/HR)	180154	355871	25620	17271	50000	390000
Sulfur (LB/HR)	6276	240	628	5410	16	240
Sulfur (as SO2)(LB/HR)	n/a	n/a	n/a	n/a	32	480

ATTACHMENT 1

Example of Baseline Coal Composition (Illinios #6)	
Heating Value (BTU/LB)	10660
SO2 (lb/mmbtu)	5.04
% Sulfur	2.83
Ash (%)	9.25
Moisture Content (%)	15.9

Representative Fuel Blend

Coal		Petcoke		Fuel Blend	
Heating Value (BTU/LB)	12200	Heating Value (BTU/LB)	14100	Heating Value (BTU/LB)	13150
% Sulfur	1	% Sulfur	6	% Sulfur	**3.5**
SO2 (lb/mmbtu)	1.56	SO2 (lb/mmbtu)	8.09	SO2 (lb/mmbtu)	5.05
Ash (%)	15	Ash (%)	0.5	Ash (%)	7.5
Moisture Content (%)	9	Moisture Content (%)	7	Moisture Content (%)	8

Comparison of Facility SO2 Emissions		
Baseline (LB/HR)		Fuel Blend (LB/HR)
521		512

TAMPA ELECTRIC
A TECO ENERGY COMPANY

October 30, 1996

Richard D. Garrity, Ph.D.
Southwest District
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619-8318

Certified Mail No. P 880 702 808
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station
Condition of Certification (PA 92-32)
Final Construction Report

Dear Dr. Garrity:

In accordance with the Conditions XII.D.1 of the Polk Power Station Conditions of Certification (PA-92-32), please find enclosed the subject quarterly construction status report.

Should you have any questions, please contact me at (813) 228-4861.

Sincerely,

Susan Mueller

Susan M. Mueller
Consulting Chemist
Environmental Planning

EP\gm\SMM1686

Enclosure

c/enc: Mr. Hamilton S. Oven - FDEP

POLK POWER STATION
QUARTERLY CONSTRUCTION REPORT

OCTOBER 1, 1996

As required by the Conditions of Certifications under section XII.D.1, a short narrative describing the progress of construction from July 1, 1996 through September 30, 1996 is as follows.

All the facilities are constructed. The station was declared commercial on September 30, 1996. The site population is approximately 250.

All operational units are functioning except for the sanitary system. This unit is not in service pending modifications to the system necessitated by the low influent flow rate. Sanitary waste are disposed off site at an approved facility.

This is the final construction quarterly report as the construction of the station is complete.

US Postal Service

Receipt for Certified Mail

No Insurance Coverage Provided.

Do not use for International Mail *(See reverse)*

Sent to Richard Gutkitz	
Street & Number FDEP	
Post Office, State, & ZIP Code SMM1686	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, April 1995

TECO
TAMPA ELECTRIC

August 11, 1998

A. A. Linero, P.E..
Administrator, New Source Review Section
Florida Department of Environmental Protection
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 805858540190

RECEIVED
AUG 12 1998
BUREAU OF
AIR REGULATION

Re: **Tampa Electric Company (TEC)**
Polk Power Station
Proof of Publication for Modification of PSD-FL-194B

Dear Mr. Linero:

I have enclosed the Affidavit of Publication for the Lakeland newspaper, The Ledger, as requested. This public notice was published on August 7th. If you have any questions, please feel free to telephone me at (813) 641-5210. Thank you.

Sincerely,

Patrick L. Shell
Engineer
Environmental Planning

EP\gm\PLS102

Enclosure

SWP
Polk Co.
J. Arif, BAR

AFFIDAVIT OF PUBLICATION
THE LEDGER
Lakeland, Polk County, Florida

Case No ....

STATE OF FLORIDA)
COUNTY OF POLK)

Before the undersigned authority personally appeared David Vail, who on oath says that he is Controller of The Ledger, a daily newspaper published at Lakeland in Polk County, Florida; that the attached copy of advertisement, being a

Public Notice Of Intent

in the matter of

DEP FILE PSD-FL-194B

in the

Court, was published in said newspaper in the issues of

August 7;

1998

Affiant further says that said The Ledger is a newspaper published at Lakeland, in said Polk County, Florida, and that the said newspaper has heretofore been continuously published in said Polk County, Florida, daily, and has been entered as second class matter at the post office in Lakeland, in said Polk County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Signed ....
David Vail
Controller
By David Vail who is personally known to me

Sworn to and subscribed before me this 7TH

day of AuGusT A.D. 19 98

(Seal) Donald Ray Jenkins
Notary Public

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

Order#706888
TECO B776

Attach Notice Here

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION
STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DEP FILE PSD-FL-194B
Polk Power Station Integrated Gasification Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Tampa Electric Company (TEC) to extend the demonstration period for gas cleaning technology from two to three years at its Integrated Gasification Combined Cycle Facility (Polk Power Station) located at 9895 State Road 37 South Mulberry, Polk County. A Best Available Control Technology determination was not required pursuant to Rule 62-212.400, F.A.C. or 40CFR52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Tampa Electric Company, Post Office Box 111, Tampa, Florida 333601-0111.

The present permit provides for a two year period to demonstrate hot gas cleanup technology at the 260 megawatt Polk Power Station that was built with joint funding by TEC and the Department of Energy (DOE). The request will defer the hot gas cleanup demonstration until the sorbent becomes more commercially viable. TEC and DOE will focus instead on other sulfur dioxide and carbon dioxide reduction activities, thus extending the demonstration period to three years. This revised period will end on September 30, 1999. The ending date for a subsequent period to demonstrate compliance with the nitrogen oxides limit of 25 ppm while operating the facility using cold gas cleanup will be extended to April 2001. A revised BACT will be issued by the Department by June 2001.

The extra year of demonstration will permit the facility to emit sulfur dioxide and nitrogen oxides emissions at higher rates than ultimately allowed by the present permit. This amount is equal to *approximately 1860 tons of nitrogen oxides and 700 tons of sulfur dioxide.*

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

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Departments Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit modification and require, if applicable, another Public Notice.

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

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

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

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

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

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

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

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

B-776 - 8-7; 1998

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Gregory N. Nelson, P.E.
Tampa Electric Co.
P O Box 111
Tampa, Fl
33601-0111

4a. Article Number
P 265 659 398

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

7. Date of Delivery 8/3/98

5. Received By: *(Print Name)*

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

6. Si
X

PS F

eceipt

Thank you for using Return Receipt Service.

P 265 659 398

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

Sent to Gregory Nelson	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
...rn Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 7-31-98 PSD-F1-194B	

PS Form 3800, April 19..

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

July 30, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Administrator, Air Programs
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Modification of DEP File PSD-FL-194B
Polk Power Station

Dear Mr. Nelson:

Enclosed is one copy of the Draft PSD Permit Modification for the Integrated Gasification Combined Cycle facility located at 9895 State Road 37, Mulberry, Polk County. The Department's Intent to Issue PSD Permit Modification and the "PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION" are also included.

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

Please submit any written comments you wish to have considered concerning the Department's proposed action to A. A. Linero, P.E., Administrator, New Source Review Section at the above letterhead address. If you have any other questions, please call Mr. Syed Arif at 850/921-9528.

Sincerely,

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

CHF/sa

Enclosures

In the Matter of an
Application for Permit Modification by:

Mr. Gregory M. Nelson, P.E.
Administrator, Air Programs
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

DEP File PSD-FL-194B
Polk Power Station
Polk County

_______________________________/

INTENT TO ISSUE PSD PERMIT MODIFICATION

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

The applicant, Tampa Electric Company, applied on February 27, 1998 to the Department for a permit modification to extend the demonstration period for gas cleaning technology from two to three years at its Integrated Gasification Combined Cycle facility located at 9895 Sate Road 37 South, Mulberry, Polk County.

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

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

Pursuant to Section 403.815, F.S., and Rule 62-110.106(7)(a)1., F.A.C., you (the applicant) are required to publish at your own expense the enclosed ""Public Notice of Intent to Issue PSD Permit Modification." The notice shall be published one time only in the legal advertisement section of a newspaper of general circulation in the area affected. For the purpose of these rules, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. Where there is more than one newspaper of general circulation in the county, the newspaper used must be one with significant circulation in the area that may be affected by the permit modification. If you are uncertain that a newspaper meets these requirements, please contact the Department at the address or telephone number listed below. The applicant shall provide proof of publication to the Department's Bureau of Air Regulation, at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, Florida 32399-2400 (Telephone: 850/488-0114; Fax 850/ 922-6979). The Department suggests that you publish the notice within thirty days of receipt of this letter. You must provide proof of publication within seven days of publication, pursuant to Rule 62-110.106(5), F.A.C. No permitting action for which published notice is required shall be granted until proof of publication of notice is made by furnishing a uniform affidavit in substantially the form prescribed in Section 50.051, F.S. to the office of the Department issuing the permit modification or other authorization. Failure to publish the notice and provide proof of publication may result in the denial of the permit modification pursuant to Rules 62-110.106(9) & (11), F.A.C.

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

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station #5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit modification and require, if applicable, another Public Notice.

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

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

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

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

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

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

Executed in Tallahassee, Florida.

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

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this INTENT TO ISSUE PSD PERMIT MODIFICATION (including the PUBLIC NOTICE, and DRAFT permit modification) was sent by certified mail (*) and copies were mailed by U.S. Mail before the close of business on 7-31-98 to the person(s) listed:

Greg Nelson, P.E.*
Doug Neely, EPA
John Bunyak, NPS
Bill Thomas, DEP SWD
Buck Oven, DEP PPS
Joe King, Polk County

Clerk Stamp

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

(Clerk) 7-31-98 (Date)

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

PUBLIC NOTICE OF INTENT TO ISSUE PSD PERMIT MODIFICATION

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DEP File PSD-FL-194B

Polk Power Station Integrated Gasification Combined Cycle Project
Polk County

The Department of Environmental Protection (Department) gives notice of its intent to issue a PSD Permit Modification to Tampa Electric Company (TEC) to extend the demonstration period for gas cleaning technology from two to three years at its Integrated Gasification Combined Cycle Facility (Polk Power Station) located at 9895 State Road 37 South, Mulberry, Polk County. A Best Available Control Technology determination was not required pursuant to Rule 62-212.400, F.A.C. or 40CFR52.21, Prevention of Significant Deterioration (PSD). The applicant's name and address are: Tampa Electric Company, Post Office Box 111, Tampa, Florida 333601-0111.

The present permit provides for a two year period to demonstrate hot gas cleanup technology at the 260 megawatt Polk Power Station that was built with joint funding by TEC and the Department of Energy (DOE). The request will defer the hot gas cleanup demonstration until the sorbent becomes more commercially viable. TEC and DOE will focus instead on other sulfur dioxide and carbon dioxide reduction activities, thus extending the demonstration period to three years. This revised period will end on September 30, 1999. The ending date for a subsequent period to demonstrate compliance with the nitrogen oxides limit of 25 ppm while operating the facility using cold gas cleanup will be extended to April 2001. A revised BACT will be issued by the Department by June 2001.

The extra year of demonstration will permit the facility to emit sulfur dioxide and nitrogen oxides emissions at higher rates than ultimately allowed by the present permit. This amount is equal to approximately 1860 tons of nitrogen oxides and 700 tons of sulfur dioxide.

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

The Department will accept written comments concerning the proposed permit modification issuance action for a period of 30 (thirty) days from the date of publication of "Public Notice of Intent to Issue PSD Permit Modification." Written comments should be provided to the Department's Bureau of Air Regulation at 2600 Blair Stone Road, Mail Station 5505, Tallahassee, FL 32399-2400. Any written comments filed shall be made available for public inspection. If written comments received result in a significant change in the proposed agency action, the Department shall revise the proposed permit modification and require, if applicable, another Public Notice.

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

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

NOTICE TO BE PUBLISHED IN THE NEWSPAPER

those entitled to written notice under Section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the public notice or within fourteen days of receipt of this notice of intent, whichever occurs first. Under Section 120.60(3), however, any person who asked the Department for notice of agency action may file a petition within fourteen days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 of the Florida Administrative Code.

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

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

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

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

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

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

September XX, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Administrator, Air Programs
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: Modification of DEP File PSD-FL-194A
Polk Power Station

Dear Mr. Nelson:

The Department reviewed your letter and application dated February 24, 1998 and additional information on June 11, 1998 requesting an extension of the demonstration period for integrated coal gasification and combined-cycle system, as well as changing dates to correlate with the extension. This request is acceptable to the Department. Following publication of the Public Notice of the Intent to Issue dated August XX, and the Department's review of comments received, the referenced permit (relevant pages attached) is hereby modified as follows:

SPECIFIC CONDITION H.2.

The maximum allowable emissions from the IGCC combustion turbine, when firing syngas and No. 2 fuel oil during the ~~two~~ three year demonstration period (until September 30, 1999), shall not exceed the following:

(Note that the rest of this condition is related to applicable emissions and is not changed by this action)

SPECIFIC CONDITION H.6.

The combustion turbine will be operated for 12-18 months after the demonstration period (estimated to be from ~~Mid 1998~~ October 1, 1999 until ~~December 31, 1999~~ April 1, 2001).

(Note that the rest of this condition is related to testing requirements and is not changed by this action)

SPECIFIC CONDITION H.7.

One month after the test period ends (estimated to be by ~~February 2000~~ June 1,2001), the permittee will submit to the Department a NO_X recommended BACT Determination as if it were a new source using data gathered on this facility, other similar facilities and the manufacturer's research. The Department will make a determination on the BACT for NO_X only and adjust the NO_X emission limits accordingly.

A copy of this letter shall be filed with the referenced permit and shall become part of the permit. This permit modification is issued pursuant to Chapter 403, Florida Statutes. Any party to this order (permit modification) has the right to seek judicial review of it under Section 120.68, F.S., by the filing of a Notice of Appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department of Environmental Protection in the Office of General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within (thirty) days after this Notice is filed with the Clerk of the Department.

Sincerely,

Howard L. Rhodes, Director
Bureau of Air Regulation

HLR/sa

Enclosures

Memorandum

Florida Department of
Environmental Protection

TO: Clair Fancy

THRU: Al Linero ALJ 7/30

FROM: Syed Arif Syed Arif

DATE: July 30, 1998

SUBJECT: Tampa Electric Company, Polk Power Station
Integrated Gasification Combined Cycle Facility
PSD-FL-194B

Attached is the Public Notice package for extending the demonstration period for gas cleaning technology from two to three years at the above referenced facility. The facility was jointly funded by Department of Energy and Tampa Electric Company.

The extra year of demonstration will permit the facility to emit sulfur dioxide and nitrogen oxides emissions at higher rates than ultimately allowed by the permit during the post demonstration period. This amount is equal to approximately 1860 tons of nitrogen oxides and 700 tons of sulfur dioxide.

The extension was requested by TEC after receiving approval from the Department of Energy to focus on other gas cleaning technologies other than hot gas cleanup. The hot gas cleanup demonstration is temporarily put on hold until the development of commercially viable sorbent.

I recommend your approval and signature.

AAL/sa

Attachments

TAMPA ELECTRIC

July 30, 1998

Syed Arif, P.E..
New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 805858540384

Re: Tampa Electric Company (TEC)
Polk Power Station
Response to Polk Demonstration Period Extension Question

Dear Mr. Arif:

This letter is to provide response to the question concerning the estimated ending date for the demonstration period included in the petcoke test burn incompleteness letter. The Polk Power Station was placed in commercial operation on September 30, 1996; therefore, the current demonstration period will end on September 30, 1998. TEC is currently compiling the information requested concerning the Petcoke Test Burn request. In addition, TEC will provide additional information concerning the date on which the unit was brought into commercial operation as requested.

Please feel free to telephone Patrick Shell or myself at (813) 641-5210, if you have any questions. Thank you.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Manager
Environmental Planning

RECEIVED
JUL 31 1998
BUREAU OF
AIR REGULATION

EP\gm\PLS101

cc: file

Fold at line over top of envelope to the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write *"Return Receipt Requested"* on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

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

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

Consult postmaster for fee.

3. Article Addressed to:
Janice Taylor
TECo
PO Box 111
Tampa, Fl 33601-0111

4a. Article Number
P 265 659 359

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

7. Date of Delivery JUN 18 1998

5. Received By: *(Print Name)* R M

6. Signature: *(Addressee or Agent)*
X R M

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

Thank you for using Return Receipt Service.

PS Form **3811**, December 1994 102595-97-B-0179 Domestic Return Receipt

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P 265 659 359

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

Sent to: Janice Taylor	
Street & Number: TECO	
Post Office, State, & ZIP Code: Tampa Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date: 6-16-98 1050233-002-AC PPO PSD F1-194A	

PS Form **3800**, April 1995

Department of
Environmental Protection

Lawton Chiles
Governor

Virginia B. Wetherell
Secretary

June 16, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Ms. Janice K. Taylor
Senior Engineer
Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: DEP File No. 1050233-002-AC; PSD-FL-194(A); PA-92-32
Polk Power Station

Dear Ms. Taylor:

The Department has received your request of May 21, 1998, to allow burning of coal/petroleum coke fuel blends as well as 100 percent coal as solid fuels for use in the Integrated Coal Gasification Combined Cycle (IGCC) combustion turbine during the demonstration period. The Department has issued an incompleteness letter on March 26, 1998, for an earlier request for extending the demonstration period for the hot gas cleanup system from two to three years. The two requests will be combined and handled as one project. Based on our initial review of this request, we have determined that additional information is needed in order to process the application. The following information is required:

1. Please indicate based on the start-up of the unit your best estimate of the ending date for the demonstration period before the extension is granted.
2. Please provide the material balances for sulfur and associated SO_2 emissions with the burning of 25%, 50% and 75% blend of petcoke which has a much higher sulfur content compared to coal.
3. Please indicate if any limitations were considered for the sulfur content of the coal for this project. If so, what was the limit considered either in the original application or during BACT discussions.
4. Please provide reasonable assurance that the current sulfuric acid plant will be capable of handling the added sulfur due to petroleum coke. What are the emissions of SO_2 from the sulfuric acid plant with the present set-up and what are the emissions expected when coal/petroleum coke blend is fired in IGCC.

5. Please provide the different scenarios under which testing will be done and the associated time periods for each scenario.

The Department will resume processing this application after receipt of the requested information. If there are any questions regarding this matter, please call me at (850)921-8968.

Sincerely,

Syed Arif, P.E.
New Source Review Section

/sa

cc: Buck Oven, DEP
Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD

TAMPA ELECTRIC

RECEIVED
JUN 16 1998
BUREAU OF
AIR REGULATION

June 11, 1998

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

Certified Mail No. P 148 152 268
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station Demonstration Period Extension
DEP File No. PSD-FL-194A; PA-92-32

Dear Mr. Linero:

We hereby provide the following responses to comments raised in your letter of March 26, 1998 regarding TEC's request to extend the demonstration period for the Polk Power Station. For ease of review, we have included your comments, followed by our corresponding responses.

FDEP Comment #1:

Please explain the need for extending the demonstration period for hot gas cleanup system from two to three years. In responding to this incompleteness, provide documentation from DOE or the equipment vendors reflecting the need for a three year demonstration period.

TEC Response:

The demonstration period for the Polk Power Station DOE-IGCC Clean Coal Project has been extended from two (2) years to three (3) years as evidenced by Amendment # A011 of TEC's Cooperative Agreement with DOE. A copy of this amendment dated May 15, 1997 has been attached hereto. In addition, because of the recent determination by DOE, GE, and TEC, that HGCU demonstration should be temporarily put on hold until development of HGCU sorbent becomes more commercially viable, DOE and TEC have agreed to modify the demonstration requirements of the cooperative agreement to shift the demonstration focus from HGCU to other sulfur and CO_2 *emissions reductions activities that provide greater overall benefit to Polk Power Station. These activities will specifically entail implementation of increased COS reduction,*

TAMPA ELECTRIC COMPANY
P. O. BOX 111 TAMPA, FL 33601-0111
(813) 228-4111
CUSTOMER SERVICE:
HILLSBOROUGH COUNTY (813) 223-0800
OUTSIDE HILLSBOROUGH COUNTY 1 (888) 223-0800

operational and hardware modifications, and TEC's participation in DOE's national CO_2 sequestration and disposal program PRDA No. DE-RA26-98FT-35008.

In addition to the above noted shifts in DOE focus, the specific requirements for TEC's alternate fuels demonstration period has been formally extended from two (2) to three (3) years. It is specifically for this extension, which requires additional fuel testing at Polk until 10-1-99, that TEC requests DEP to extend the Polk demonstration duration for a similar period.

FDEP Comment #2:

Please explain the effect of additional 2,908 tons of NO_X and 2,269 tons of SO_2 emissions if the demonstration period is extended for one year by the Department. In responding to this incompleteness, provide analyses, if required, to show no violations of National Ambient Air Quality Standards.

TEC Response:

Extending the demonstration period for one year will not have an adverse environmental impact. Specifically, no violations of the National or Florida Ambient Air Quality Standards (AAQS) are predicted. Dispersion modeling of the complete Polk Power Station build-out was conducted during the site certification and prevention of significant deterioration (PSD) permitting process. The complete build-out included the IGCC (both demonstration and post-demonstration modes), four (4) natural gas-fired combustion turbines in combined-cycle mode, and six (6) natural gas-fired combustion turbines in simple-cycle mode. This dispersion modeling demonstrated no violations of the national or Florida AAQS. Relying on the results of this dispersion modeling is appropriate because:

1. *An increase in the demonstration period emissions limits is not being requested. TEC is requesting the existing demonstration period be extended as is for one (1) year.*

2. *The dispersion modeling was very conservative because the full site buildout scenario, at full load, was modeled.*

FDEP Comment #3:

Please provide updated information on the hot gas cleanup technology. What percent gas stream will be used for hot gas cleanup technology. What effect will it have on pollutant emissions. Provide any information relating to the feasibility of this technology since the original application was submitted to the Department in September 1992.

<u>*TEC Response:*</u>

The Polk IGCC unit has included in its design a HGCU slip stream unit that can process 10% of the total syngas flow generated at Polk Power Station. This system is in addition to the 100% capacity traditional cold gas clean-up system which has been installed in parallel with the HGCU system.

The HGCU system was designed to remove in excess of 99% of the sulfur from its 10% flow stream.

Attached is a position paper regarding the status of hot gas cleanup and other pollution control strategies which DOE is preparing for imminent release. Please treat this position paper as Confidential until it is formally released by DOE.

It is our understanding that the Department will resume processing our request to extend the Polk Power Station demonstration period upon receipt of the above responses. Should you have any further questions or comments regarding this matter, please call me at (813) 641-5016.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Administrator - Air Programs
Environmental Planning

EP\gm\GMN108

Attachments

cc: S. Arif, BAR
Polk Co.
SWD

DOE F 4600.1
(7-81)

U.S. DEPARTMENT OF ENERGY
NOTICE OF FINANCIAL ASSISTANCE AWARD
(See Instructions)

Under the authority of Public Law 100-446 and 101-45 and subject to legislation, regulations and policies applicable to *(cite legislative program title)*: Department of Energy Clean Coal Technology

1. PROJECT TITLE Tampa Electric Company Integrated Gasification Combined-Cycle Project	2. INSTRUMENT TYPE ☐ GRANT ☒ COOPERATIVE AGREEMENT
3. RECIPIENT *(Name, address, zip code, area code and telephone no.)* Tampa Electric Company P.O. Box 111 Tampa, FL 33601	4. INSTRUMENT NO. DE-FC21-91MC27363 5. AMENDMENT NO. A011 6. BUDGET PERIOD From: 10/01/96 To: 09/30/01 7. PROJECT PERIOD From: 03/18/91 To: 09/30/01
8. RECIPIENT PROJECT DIRECTOR *(Name and telephone No.)* Charles R. Black (813) 228-1767	10. TYPE OF AWARD ☐ NEW ☐ CONTINUATION ☐ RENEWAL ☒ REVISION ☐ SUPPLEMENT
9. RECIPIENT BUSINESS OFFICER *(Name and telephone No.)* Charles R. Black (813) 228-1767	12. ADMINISTERED FOR DOE BY *(Name, address, zip code, telephone No.)* Alexis W. Puher (304) 285-4084 Federal Energy Technology Center P.O. Box 880 Morgantown, WV 26507-0880
11. DOE PROJECT OFFICER *(Name, address, zip code, telephone No.)* Nelson F. Rekos (304) 285-4066 P.O. Box 880 Morgantown, WV 26507-0880	

13. RECIPIENT TYPE
☐ STATE GOV'T ☐ INDIAN TRIBAL GOV'T ☐ HOSPITAL ☒ FOR PROFIT ORGANIZATION ☐ INDIVIDUAL
☐ LOCAL GOV'T ☐ INSTITUTION OF HIGHER EDUCATION ☐ OTHER NONPROFIT ORGANIZATION ☒ C ☐ P ☐ SP ☒ OTHER *(Specify)*

14. ACCOUNTING AND APPROPRIATIONS DATA

a. Appropriation Symbol	b. B & R Number	c. FT/AFP/OC	d. CFA Number	15. EMPLOYER I.D. NUMBER/SSN
89X0235.91	AZ0502020	H1/255 MB-75-91	790209	59-0475140

16. BUDGET AND FUNDING INFORMATION

a. CURRENT BUDGET PERIOD INFORMATION

(1) DOE Funds Obligated This Action	$ 7,900,000
(2) DOE Funds Authorized for Carry Over	$ 0
(3) DOE Funds Previously Obligated in this Budget Period	$ 20,100,000
(4) DOE Share of Total Approved Budget	$ 28,000,000
(5) Recipient Share of Total Approved Budget	$ 29,500,000
(6) Total Approved Budget	$ 57,500,000

b. CUMULATIVE DOE OBLIGATIONS

(1) This Budget Period *[Total of lines a.(1) and a.(3)]*	$ 28,000,000
(2) Prior Budget Periods	$ 122,894,223
(3) Project Period to Date *[Total of lines b.(1) and b.(2)]*	$ 150,894,223

17. TOTAL ESTIMATED COST OF PROJECT $ 303,288,446
(This is the current estimated cost of the project. It is not a promise to award nor an authorization to expend funds in this amount.)

18. AWARD/AGREEMENT TERMS AND CONDITIONS

This award/agreement consists of this form plus the following:

a. Special terms and conditions (if grant) or schedule, general provisions, special provisions (if cooperative agreement)

b. Applicable program regulations *(specify)* ______ *(Date)* ______

c. DOE Assistance Regulations, 10 CFR Part 600, as amended, Subparts A and ☐ B (Grants) or ☒ C (Cooperative Agreements).

d. Application/proposal dated 08/89, ☐ as submitted ☒ with changes as negotiated

19. REMARKS

Reference Pages 2 and 3 for description of amendment.

20. EVIDENCE OF RECIPIENT ACCEPTANCE	21. AWARDED BY
(Signature of Authorized Recipient Official) *(Date)*	Randolph R. Cooper *(Signature)* 5/15/97 *(Date)*
(Name)	Randolph R. Cooper *(Name)*
(Title)	Contracting Officer *(Title)*

STANDARD FORM 36, JULY 1966 GENERAL SERVICES ADMINISTRATION FED. PROC. REG. (41 CFR) 1-16.101	CONTINUATION SHEET	REF. NO. OF DOC. BEING CONTD. DE-FC21-91MC27363 A011	PAGE 2 OF 3
NAME OF OFFEROR OR CONTRACTOR Tampa Electric Company			

The purpose of this amendment A011 is to provide additional funds to cover the expenses resulting from syngas heat exchanger failure including repairs to the brine concentration system, O&M expenses for the third year of operation on coal fuels or coal blends including the expenses associated with the hot gas cleanup system (HGCU). This amendment fixes the demonstration period at 5 years with the Participant providing DOE the plant operational data throughout the 5 year period. This amendment to the Cooperative Agreement, and the corresponding amendment to the Repayment Agreement, expand the commercialization and repayment efforts to worldwide applications of the IGCC technology.

Accordingly, this Cooperative Agreement is revised as follows:

1. In Schedule Article VII(B) and (C), delete the word "(maximum)."

2. Schedule Article VII(D)'s footnote is changed to read "Phase III costs reflect only the first 3 years of the 5 year plant operational period."

3. The following cost figures in Schedule Article VII (D) are revised as shown below:

TOTAL ESTIMATED PROJECT COST	"$303,288,446"	
<u>Phase III</u>		
DOE Share	"$28,000,000"	"48.7%"
Participant Share	"$29,500,000"	"51.3%"
<u>Total</u>		
DOE Share	"$150,894,223"	"49.8%"
Participant Share	"$152,394,223"	"50.2%"

4. Schedule Article X(C) <u>Project Costs Allowable for Cost-Sharing Purposes</u> -- subarticle (9) is replaced with the following: "DOE's cost sharing for Budget Period 3 shall be applied to the first 3 years of Phase III. Normal operation and maintenance (O&M) (HGCU sorbent replacement excluded) costs after the first 3 years of Phase III shall be at no cost to the Government."

5. Article XXV <u>Commercialization</u> is replaced with the following: "The Participant agrees to exercise its best efforts to commercialize, or to assist others to commercialize, in the United States and throughout the world, oxygen-blown IGCC technology in accordance with Attachment E."

6. Schedule Article XXXV is replaced with the following:

"<u>ARTICLE XXXV -- Phase III Testing and Cost Limitations</u>

During the first 3 years of the Phase III, 5 coals or coal blends will be tested and formal reports of their performance issued to DOE. Based on a positive determination during this 3-year period, jointly concurred in by DOE, General Electric Environmental Services, Inc. (GEESI), and the Participant, that the HGCU system continues to hold significant promise to become technically and commercially viable, the Participant agrees to exert good faith efforts to make the HGCU system work through Phase III or until a mutual determination has been made as described in the fourth paragraph of this article.

In support of this commitment, if such a positive determination is made, the Participant shall, with the concurrence of DOE and GEESI, develop and execute a plan (Plan) for the required system(s) to allow an additional period of operation of the HGCU system during the course of the Participant's commercial operation of the Polk Unit 1 plant. This additional period of operation will be for 2 years after the third year of Phase III and shall be conducted at no expense to the Government (except that HGCU sorbent replacement will continue to be eligible for DOE cost sharing as described below). The Participant shall provide DOE with operating data from both the HGCU

STANDARD FORM 36, JULY 1966 GENERAL SERVICES ADMINISTRATION FED. PROC. REG. (41 CFR) 1-16.101	CONTINUATION SHEET	REF. NO. OF DOC. BEING CONTD. DE-FC21-91MC27363 A011	PAGE 3 OF 3

NAME OF OFFEROR OR CONTRACTOR
Tampa Electric Company

REC: DUP/FAX

97 MAY -5 AM 10:07

system and the remainder of the Polk Unit 1 plant during this additional operating period. DOE requirements for this data shall not create an unreasonable financial burden on the Participant.

In further support of this commitment, if such a positive determination is made, the Participant shall provide, and the Government shall not share in, the first $3,000,000 required during Phase III for addition to, or repair or modification of, the HGCU system or ancillary systems necessary for the proper operation of the HGCU system. After this $3,000,000 has been expended, additional capital expenses for any necessary system changes (including sorbent replacement) will be considered for DOE cost sharing in accordance with Article XII, paragraphs (C) and (D). The DOE is not obligated to provide such funding.

If at anytime during Phase III operation the HGCU is determined by mutual agreement by DOE, GEESI, and the Participant to be technically or commercially unfeasible, the Participant shall be released of its obligation to make the HGCU system work but shall continue to provide data from the commercially operated Polk Unit 1 plant to complete the Participant's obligation to provide data for 5 years of plant operation during Phase III.

It is the intent of this Cooperative Agreement to demonstrate a HGCU system which can be operated independently of selective catalytic reduction (SCR) technology. Therefore, the HGCU shall be determined to be unfeasible in the event that state or Federal regulatory agencies amend the Polk Unit 1 permits to require, as a condition of the Participant operating the HGCU system, that an SCR system be installed on the Polk Unit 1 plant. In such event, the Participant's remaining obligation to DOE shall be as described in the preceding paragraph.

Notwithstanding the specific requirements of the Cooperative Agreement related to the initial three (3) year demonstration period, during the subsequent two (2) year period of commercial operation, the Participant shall be authorized to operate the Facility in accordance with its standards of prudent utility practice (Participant's least cost of operation) for commercial dispatch and operating conditions. Consistent with the above, operation and maintenance costs (excluding HGCU sorbent replacement) during the subsequent two (2) year period of commercial operation shall not be allowed for cost-sharing purposes as defined in Article X(C) of this Cooperative Agreement.

Notwithstanding any provision of this Article XXXV, all O&M expenses for the Polk Unit 1 plant beyond the first 3 years of Phase III shall be borne by the Participant with no Government cost sharing (except that HGCU system sorbent replacement will continue to be eligible for DOE cost sharing after the Participant has expended the first $3,000,000 for fixes, as described above)."

7. Statement of Work, Project Description, C. Project Budget Periods -- change Budget Period 3 duration to "sixty (60) months."

8. Upon execution of this amendment, the maximum Department of Energy (DOE) cost sharing has been reached, and no additional DOE funds beyond the $150,894,223, presently obligated, shall be authorized for this project.

9. All other terms and conditions of this Cooperative Agreement remain unchanged.

END OF AMENDMENT A011

APUHER\1:970841.W52

OPTIONAL FORM 99 (7-90) Sent by: P. Nacce 05-15-97

FAX TRANSMITTAL # of pages ► 3

To Don Ploss	From Nelson Rekos
Dept./Agency	Phone #
Fax # 941-428 5939	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

Cooperative Agreement DE-FC21-91M27363 Tampa Electric Integrated Gasification Combined-Cycle (IGCC) Clean Coal Demonstration Project

Subject: Suspension of Testing/Operating the Hot Gas Cleanup System (HGCU) - GEESI's Moving-Bed Desulfurization Technology at Tampa Electric

Summary:
After extensive discussion with General Electric (GE) and Tampa Electric, DOE has concurred with Tampa Electric's recommendation that the testing of GEESI's moving bed desulfurization system at Tampa's IGCC facility at Polk Power Station be put on hold until such time that the moving bed technology becomes more commercially viable. The recommendation is based on several recent events including: 1) The moving bed system design for 10% of the gasifier syngas flow has several technical problems which would have to be resolved/repaired before any long term testing could start; 2) GE believes that no near term market exists to justify further development of the moving bed technology Furthermore, GE, the parent company of GEESI (the technology vendor), has sold the company to Marsulex but did not sell the rights to the HGCU, and 3) Tampa feels there are other emissions reduction activities that would provide a greater benefit to the Polk plant with applications to other IGCC systems.

Background
Tampa Electric's IGCC Project is part of the DOE Clean Coal Program, Round 3 Solicitation. The project is for the demonstration for a nominal 250-MWe oxygen-blown, integrated gasification combined-cycle utilizing a Texaco gasifier and a GE 7F frame combustion turbine. Bechtel Engineering worked with Texaco to design the system that includes a 100% flow conventional cold gas (amine-based) cleanup system and a 10% GEESI designed slipstream moving bed desulfurizer. The overall project cost was approximately $600 million with DOE contributing $150 million toward the construction and the three year demonstration period. The IGCC plant began producing power from clean syngas in October 1996, achieving a 45% plant availability on coal during 1997. These successes have been achieved while the plant operated on four different coal fuels with the conventional cold gas cleanup system. During this time, the GEESI moving bed desulfurization system completed its cold flow checkout with a regenerable metal-oxide sorbent. In February 1998, following a careful review of the moving bed status, including the poor results from the cold flow checkout tests, Tampa Electric with GE's concurrence, recommended to DOE that testing of the moving-bed system be put on hold.

The significant events that precipitated Tampa's recommendation are:

1) In November 1997, the cold flow system testing with the hot gas desulfurization sorbent at Tampa revealed that the attrition rate for the metal-oxide sorbent was significantly higher than required for commercial operation at Polk station. Further, the cold flow tests revealed that the system could not be operated in an automatic mode, and significant manpower would be required to maintain its

operation. Finally, the stainless steel selected for the moving-bed was found to be susceptible to stress corrosion cracking due to the high alkali levels in the flyash. This corrosion would be accelerated during shutdown periods due to the high local humidity in central Florida which caused any residual flyash in the pipe to convert to acids. While none of the problems were felt to be insurmountable, Tampa determined that additional capital and manpower would be required to resolve them.

2) GE reviewed the status and the near term commercial marketability of the moving-bed technology and informed Tampa that their focus was no longer aimed at investing additional capital or manpower to support the HGCU technology at Polk. In addition, in October, 1997, GEESI announced that it had been sold to Marsulex. Marsulex did not acquire the moving-bed technology. Therefore, the responsibility and any commitments to Tampa for the system reverted to GEESI's parent company GE.

During the same time, Tampa had identified several areas within the plant where an equivalent effort, as had been planned for testing of the moving-bed, could produce significant environmental benefits to the Polk plant and to IGCC applications worldwide. Tampa proposed to DOE that by implementing several modifications and capital improvements additional reductions in both CO2 and SO2 may be achieved. These reductions are significantly better than those expected from the slip-stream moving-bed system which would have improved only sulfur emissions by 5% over conventional cold gas cleanup system. Further the technologies used to obtain these sulfur and CO2 emissions have not been utilized at any other IGCC system and could be applied in IGCC applications worldwide.

Based on the above information, DOE believes it is in the best interest of all parties to suspend testing and operation of the GEESI system until all the issues associated with the system can be remedied. DOE also believes that it is in the best interest of all parties that the recommendations of Tampa Electric for further reduction of SO2 and CO2 emissions stated herein be pursued and the appropriate modifications to the cooperative agreement be made to include the stated improvements.

TECO

TAMPA ELECTRIC

May 21, 1998

Mr. A.A. Linero, P.E., Administrator
New Source Review Section
Florida Department of Environmental Protection
Bureau of Air Regulation
111 South Magnolia Drive, Suite 4
Tallahassee, Florida 32301

Via FedEx
Airbill No. 803727908962

Re: Tampa Electric Company (TEC) 1050233-002-AC
Polk Power Station
Request to Amend PSD-FL-194 for the use of Coal/Petroleum Coke Solid Fuel Blend

Dear Mr. Linero: PSD-FL-194 B

The Florida Department of Environmental Protection (FDEP), Bureau of Air Regulation, currently authorizes Tampa Electric Company (TEC) to operate the Polk Power Station under Permit PSD-FL-194. The permitted equipment includes, but is not limited to, one 260 MW (nominal) integrated coal gasification combined cycle (IGCC) combustion turbine (CT). In addition to the CT, the complete IGCC includes a solid fuel handling and storage system, a solid fuel gasification system, hot gas and cold gas clean-up systems, a sulfuric acid plant, and other ancillary equipment.

TEC is requesting an amendment to Permit PSD-FL-194 to include up to a 25% coal/75% petroleum coke fuel blend as well as 100 percent coal as solid fuels for use in the IGCC. The coal/petroleum coke fuel blend will be handled in the same manner as coal is currently handled at the facility. No changes will be made to the CT or any of the solid fuel handling, gasification, hot and cold gas clean-up, or acid plant equipment or processes. The syngas generated from the coal/petroleum coke blend and supplied to the CT will be comparable to the syngas generated from 100 percent coal gasification. No emissions increase is expected from coal/petroleum coke-produced syngas versus 100 percent coal-generated syngas.

TEC will conduct applicable emissions testing of the CT during the combustion of coal/petroleum coke blend-produced syngas-firing to provide reasonable assurance that emissions have not increased. This testing will be integrated into the required Demonstration Period testing program. A test protocol will be submitted to FDEP prior to testing, consistent with permit and regulatory requirements.

As we discussed in our telephone conversation on May 15, 1998 enclosed is a $250.00 processing fee. TEC appreciates your timely review of this amendment request. Please call me at (813) 641-5039 if you have any questions or wish to discuss any aspect of this request.

Sincerely,

Janice K. Taylor
Senior Engineer
Environmental Planning

Enclosure

EP\gm\JKT836

c: Mr. Hamilton Oven, FDEP - Tallahassee

cc: SWD
Polk Co.

TECO PRODUCTION SERVICES
PETTY CASH
6944 US HIGHWAY 41 NORTH
APOLLO BEACH, FL 33572
813-671-3361

0348

May 19, 19 98

63-469/631
31

PAY TO THE ORDER OF Florida Department of Environmetal Protection $ 250.00

Two hundred fifty and no/100------------------------------------ DOLLARS

© Clarke American W

Barnett Bank
040-031
203 Apollo Beach Boulevard
Apollo Beach, Florida 33572

FOR PPS Permit J. Taylor

Nancy E. Foley

[redacted]

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

March 26, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Gregory M. Nelson, P.E.
Administrator - Air Program
Environmental Planning
Tampa Electric Company
Post Office Box 111
Tampa, Florida 33601-0111

Re: DEP File No. PSD-FL-194(A); PA-92-32
Polk Power Station

Dear Mr. Nelson:

The Department received your request of February 24, 1998, to modify the specific conditions of the above referenced permit. The modification entails extending the demonstration period for the hot gas cleanup system from two to three years and associated date changes. Based on our initial review of your request, we have determined that additional information is needed in order to process the application. The following information is required:

1. Please explain the need for extending the demonstration period for hot gas cleanup system from two to three years. In responding to this incompleteness, provide documentation's from DOE or the equipment vendors reflecting the need for a three year demonstration period.

2. Please explain the effect of additional 2,908 tons of NO_x and 2,269 tons of SO_2 emissions if the demonstration period is extended for one year by the Department. In responding to this incompleteness, provide analyses, if required, to show no violations of National Ambient Air Quality Standards.

3. Please provide updated information on the hot gas cleanup technology. What percent gas stream will be used for hot gas cleanup technology. What effect will it have on pollutant emissions. Provide any information relating to the feasibility of this technology since the original application was submitted to the Department in September 1992.

The Department will resume processing this application after receipt of the requested information. If there are any questions regarding this matter, please call Mr. Syed Arif, P.E. at (850)921-8968.

Sincerely,

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

AAL/sa/a

cc: Buck Oven, DEP
Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD

Fold at line over top of envelope to the right of the return address

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, 4a, and 4b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write '*Return Receipt Requested*' on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Gregory M. Nelson, PE
Environmental Planning
Air Program
Tampa Electric Co
P.O. Box 111
Tampa, Fl 33601-0111

4a. Article Number
P 265 659 319

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

7. Date of Delivery
3-30-98

5. Received By: (*Print Name*)

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

6. Signature: (*Addressee or Agent*)
X

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

Thank you for using Return Receipt Service.

P 265 659 319

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

Sent to Gregory Nelson	
Street & Number TECO	
Post Office, State, & ZIP Code Tampa, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 0510-F1-194(a) PA 92-32	3-26-98

PS Form **3800**, April 1995

Check Sheet

Company Name: TECO - Polk Power Station
Permit Number:
PSD Number: PSD FL-194
Permit Engineer:

Application:

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

Cross References:

- [ ]
- [ ]
- [ ]

Intent:

- [x] Intent to Issue
- [x] Notice of Intent to Issue
- [x] Technical Evaluation
- [x] BACT or LAER Determination
- [x] 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 or LAER Determination
  - [ ] Other

Post Permit Correspondence:

- [ ] Extensions/Amendments/Modifications
- [ ] Other

To: Maryjane 10/21
from: Kim Tober

TECO
TAMPA ELECTRIC

February 24, 1998

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

Certified Mail No. P 240 442 441
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station
PSD-FL-194(A)

Dear Clair:

Enclosed for processing is a request for modification of PSD Permit No. FL-194(A) for the Polk Power Station. Also enclosed is a check in the amount of $250.00 for processing.

We are requesting that three specific conditions in the permit be changed to extend the demonstration period for the integrated coal gasification and combined-cycle system. We are requesting that Condition H.2. of the permit be modified to change the demonstration period from two to three years. We are requesting that Specific Condition H.6. be changed so that the 12 to 18 month demonstration period will commence October of 1999 and expire April of 2001. We are also requesting that Condition H.7. be modified to allow two months after the test period ends for submittal of a BACT determination and to adjust the test period ending date from February 2000 to June of 2001. The modifications are required under the Department of Energy agreement due to delays in the commercial operation of the hot gas cleanup system.

Please let me know if you have any questions or require additional information. You can contact me at (813) 641-5016.

Sincerely,

Gregory M. Nelson

Gregory M. Nelson, P.E.
Administrator - Air Programs
Environmental Planning

RECEIVED
MAIL ROOM
FEB 27 98

EP\gm\GMN103

Enclosure

c: Mr. H.S. Oven, FDEP - Tallahassee
EPA
SWD
NPS

Sgd ary. BAC

FLORIDA DEP LOGO

Department of Environmental Protection

304043

RECEIVED MAIL ROOM FEB 27 98

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1. Facility Owner/Company Name: Tampa Electric Company	
2. Site Name: Polk Power Station	
3. Facility Identification Number: 1050233	[ ] Unknown
4. Facility Location: Street Address or Other Locator: 9895 S.R. 37 South; City: Mulberry; County: Polk; Zip Code: 33860-0775	
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	27 February, 1998
2. Permit Number:	
3. PSD Number (if applicable):	PSD-FL-194(A)
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Patrick A. Ho
   Manager, Environmental Planning
   Tampa Electric Company

2. Owner/Authorized Representative or Responsible Official Mailing Address:

   Organization/Firm: Tampa Electric Company
   Street Address: 702 N. Franklin St.
   City: Tampa State: FL Zip Code: 33602

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: (813) 641- 5044 Fax: (813) 641 - 5081

4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

   Patrick A. Ho
   Signature

   2/24/98
   Date

* Attach letter of authorization if not currently on file.

Scope of Application

This Application for Air Permit addresses the following emissions unit(s) at the facility. An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

Emissions Unit ID	Description of Emissions Unit	Permit Type
001	260 MW Combined Cycle Combustion Turbine (IGCC)	PSD

Purpose of Application and Category

Check one (except as otherwise indicated):

Category I: All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C. N/A

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: ______________________________

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed: ______________________________

[ ] Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: ______________________________

Operation permit to be revised: ______________________________

[ ] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. Also check Category III.

Operation permit to be revised/corrected: ______________________________

[ ] Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit to be revised: ______________________________

Reason for revision: ______________________________

____

Category II: All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C. N/A

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s): ____________________

[ ] Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed: ____________________

[ ] Air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit to be revised: ____________________

Reason for revision: ____________________

____

Category III: All Air Construction Permit Applications for All Facilities and Emissions Units N/A

This Application for Air Permit is submitted to obtain:

[ ] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any: ____________________

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s): ____________________

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Check one:

[x] Attached - Amount: $ 250.00 [ ] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations: Minor modification of PSD Permit - PSD-FL-194 - as described in cover letter.
2. Projected or Actual Date of Commencement of Construction: N/A
3. Projected Date of Completion of Construction: N/A

Professional Engineer Certification

1. Professional Engineer Name: Registration Number:
2. Professional Engineer Mailing Address: Organization/Firm: Street Address: City: State: Zip Code:
3. Professional Engineer Telephone Numbers: Telephone: ( ) - Fax: ( ) -

4. Professional Engineer Statement:

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

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

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

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

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

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

Signature Date

(seal)

* Attach any exception to certification statement.

Application Contact

1. Name and Title of Application Contact: Gregory M. Nelson, P.E. Administrator - Air Programs Environmental Planning	
2. Application Contact Mailing Address: Organization/Firm: Tampa Electric Company Street Address: 702 N. Franklin St. City: Tampa State: FL Zip Code: 33615	
3. Application Contact Telephone Numbers: Telephone: (813) 641 - 5016	Fax: (813) 641 - 5081

Application Comment

Minor modification of PSD permit PSD-FL-194 as described in cover letter.

RECEIVED

MAR 17 1997

BUREAU OF
AIR REGULATION

TAMPA
ELECTRIC
A TECO ENERGY COMPANY

March 11, 1997

Mr. Hamilton S. Oven, P.E.
Administrator-Siting Office
Florida Department of Environmental Protection
3900 Commonwealth Boulevard, MS 48
Tallahassee, Fl. 32399-3000

Via Fax and
Certified Mail No. P 257 081 538
Return Receipt Requested

Mr. Alvaro A. Linero, P.E.
Administrator-New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road, MS 5505
Tallahassee, Fl. 32399-2400

Via Fax and
Certified Mail No. P 257 081 539
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station
Air Performance Testing and Continuous Emissions Monitoring Certification

Gentlemen:

As you are aware, TEC is currently completing required performance testing and continuous emissions monitoring certification at our Polk Power Station. TEC had planned to complete this testing within the 180 day window, which ends March 12, 1997, as referenced in our permits. However due to unexpected operating delays and outages of the IGCC unit, TEC will not be able to meet this schedule. Therefore, TEC request a ninety day extension in time to complete the performance testing and certification.

Please be advised that TEC will provide telephone notification to the appropriate FDEP personnel prior to initiation of this testing. If you have any questions, please feel free to call Mr. Phil Matonte at (813) 641-5035 or me at (813) 641-5039. Thank-you in advance for your consideration in this matter.

Sincerely,

Janice K. Taylor
Senior Engineer
Environmental Planning

EP\gm\JKT788

c: Mr. Mike Harley, FDEP - Tallahassee
Mr. Bill Proses, FDEP - Tampa

TAMPA ELECTRIC
A TECO ENERGY COMPANY

Circulate
Marty - Is 0.04% N in oil good?
Mike Harley
Syed Arif
Heather Hirst - To appropriate file

RECEIVED
OCT 22 1996
BUREAU OF
AIR REGULATION

October 18, 1996

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

Certified Mail No. P 880 007 860
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station
PA #92-32 Conditions of Certification XIII.H
Combustion Turbine Oil Fuel Bound Nitrogen Content Data

Dear Mr. Fancy:

In accordance with Conditions of Certification XIII.H included with this letter is the Laboratory Test Report for fuel bound nitrogen for the No. 2 fuel oil burned in the Polk Unit 1 combustion turbine.

Should you have any questions on this matter please contact me at (813) 228-4835.

Sincerely,

Philip J. Matonte

Philip J. Matonte
Consulting Engineer
Environmental Planning

EP\gm\PJM062

c: Mr. William C. Thomas, FDEP
Mr. Nelson F. Rekos Jr., US DOE

From: Tampa Electric Company
Laboratory Services Department
5012 Causeway Blvd. Tampa, FL 33597
H.R.S. Certification # E54272
D.E.P. Comprehensive QA Plan #910140

July 1, 1996

To: Fuel Data Coord., Envir. Plan.
Laboratory Suprv., Polk Power

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

Sample I.D. AA30404 Location code: PK-#2-D
Location Description: Polk Power, #2 Oil, Daily
Sample collector: JNM
Sample collection date: 06/02/96 Time: 08:30
Lab submittal date: 06/21/96 Time: 12:32
Sample Matrix: Oil

Sample Identification Information
Location description: PPS

Parameter	**Result**	**Units**	**MDL**
BTU/Gal., Calculated for Oil	138310	BTU/Gal.	
Sulfur in Oil	0.02	%	0.02
Relative Density 60/60 Deg. F	0.8498		0.0001
Pounds SO2 / Million BTU, Oil	0.0202	Lbs. SO2/MMBTU	
BTU/Lb., for Oil	19544	BTU/Lb.	1
Pounds / Gallon @ 60 Deg. F	7.077	Lbs./Gal.	
API Gravity @ 60 Deg. F	35.0	Degrees API	0.1
Nitrogen, in Oil, by CHN	0.04	%	0.01

If there are any questions regarding this data, please call.

Robert L. Dorey
Supervisor of Laboratory Services

TAMPA ELECTRIC
A TECO ENERGY COMPANY

August 12, 1996

Mr. Hamilton S. Oven, P.E.
Administrator, Power Plant Siting
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Certified Mail No. P 880 007 639
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station; PA-92-32, PSD-FL-1294
Notification of Startup Operations

Dear Mr. Oven:

Tampa Electric Company (TEC) is presently in the process of start-up of the integrated coal gasification combined cycle (IGCC) phase of the Polk Power Station (PPS) project. As you know, this first phase known as Polk Unit 1, consists of coal gasification equipment, a nominal 190-MW advanced combustion turbine (CT), a heat recovery steam generator (HRSG), a steam turbine, and ancillary support equipment. Construction of Polk Unit 1 commenced on May 1, 1994 with start of commercial operation planned for September 1996.

This letter is to describe knowledge learned from the initial operation and debugging of the IGCC equipment that is currently in progress and expected to continue through the early stages of operation. During this initial operating period, it is anticipated that there will be numerous periods of startups and shutdowns of the IGCC equipment as the process is brought on-line and optimized. As noted in the PPS Site Certification Application, flaring of both raw and clean syngas will occur during startups, shutdowns and malfunctions. Although we expect this flaring operation to be brief (*i.e.*, less than 12 hours), our current experience has indicated that flaring of raw syngas may occur continuously for approximately 12 or more hours and flaring of clean syngas may occur for 72 or more hours until the syngas process equipment becomes fully operational.

Please be assured this is not intended to be the normal operation of the plant. Flaring of the syngas is very costly to TEC since minimal electricity is produced from the fuel. TEC is only flaring as absolutely necessary for safety purposes or to minimize the overall amount of flaring associated with shutting down and restarting prior to completing needed initial safety testing, equipment commissioning and similar occurrences. The frequency and duration of startups and shutdowns should decrease significantly following the initial operating period.

Although this is a minor clarification to information we previously submitted to your agency, we felt a notification was appropriate. Once commercial operation begins, we will handle any future unknown major deviations with a modification at a later date or through the upcoming Title V permitting process. Should you have any questions concerning this matter, please contact Mr. Philip Matonte or me at (813) 228-4835.

Sincerely,

Patrick A. Ho

Patrick A. Ho, P.E.
Manager
Environmental Planning

EP\gm\PJM056

al

TAMPA ELECTRIC
A TECO ENERGY COMPANY

May 14, 1996

Mr. Hamilton S. Oven, P.E.
Administrator, Power Plant Siting
Florida Department of
Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Certified Mail No. P 880 007 759
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station; PA-92-32, PSD-FL-1294
Notification of Startup Operations

Dear Mr. Oven:

Tampa Electric Company (TEC) is presently completing construction of the integrated coal gasification combined cycle (IGCC) phase of the Polk Power Station (PPS) project. As you know, this first phase known as Polk Unit 1, consists of coal gasification equipment, a nominal 190-MW advanced combustion turbine (CT), a heat recovery steam generator (HRSG), a steam turbine, and ancillary support equipment. Construction of Polk Unit 1 commenced on May 1, 1994 with start of commercial operation planned for September 1996.

This letter is to describe the initial operation and debugging of the IGCC equipment that is projected to commence in mid-June, 1996 and continue through the early stages of operation. During this initial operating period, it is anticipated that there will be numerous periods of startups and shutdowns of the IGCC equipment as the process is brought on-line and optimized. As noted in the PPS Site Certification Application, flaring of both raw and clean syngas will occur during startups, shutdowns and malfunctions. Although we expect this flaring operation to be brief, it is possible that flaring of raw syngas may occur continuously for up to 12 hours and flaring of clean syngas may occur for up to 72 hours until the syngas process equipment becomes fully operational. The frequency and duration of startups and shutdowns will decrease following the initial operating period.

Although this is a minor clarification to what we previously submitted to your agency, we felt a notification was appropriate. Once commercial operation begins, we will handle major deviations with a modification at a later date or through the upcoming Title V permitting process. Should you have any questions concerning this matter, please contact Mr. Philip Matonte or me at (813) 228-4835.

Sincerely,

Patrick A. Ho

Patrick A. Ho, P.E.
Manager
Environmental Planning

EP\gm\PJM037

cc Clair
AC
DEPARTMENT OF ~~OSyed~~
ENVIRONMENTAL PROTECTION (2) Files on
APR 29 1996 TECO Polk

SITING COORDINATION

TAMPA ELECTRIC
A TECO ENERGY COMPANY

April 25, 1996

Richard D. Garrity, Ph.D.
Southwest District
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619-8318

Certified Mail # P 880 006 210
Return Receipt Requested

Re: Tampa Electric Company
Polk Power Station
PA #92-32 Conditions of Certification XIII.N.3
Notification of Actual Startup for the Combustion Turbine

Dear Dr. Garrity:

In accordance with Conditions of Certification XIII.N.3, we offer notification of the actual startup of the combustion turbine. The unit came on line on April 20, 1996 and was in operation for approximately 5 minutes.

Should you have any questions on this matter please contact me or Phil Matonte at (813) 228-4860.

Sincerely,

Jamie T. Woodlee

Jamie T. Woodlee
Technician
Environmental Planning

EP\gm\JTW491

c: Mr. Hamilton S. Oven, FDEP
Mr. Nelson F. Rekos Jr., US DOE

TAMPA ELECTRIC
A TECO ENERGY COMPANY

D.E.P
JUL 24 1996
SOUTHWEST DISTRICT
TAMPA

July 23, 1996

Mr. Gerald J. Kissell, P.E.
Division of Air Resource Management
Southwest District
Florida Department of Environmental Protection
3804 Coconut Palm Drive
Tampa, Florida 33619

Certified Mail No. P 880 007 818
Return Receipt Requested

RECEIVED
AUG 1 1996
BUREAU OF
AIR REGULATION

Re: Tampa Electric Company
Polk Power Station Unit 1
Written Confirmation of Telephone Call of July 20, 1996
Notification of Initial Start Up Syngas Flaring

Dear Mr. Kissell:

This letter is to confirm the telephone message I left for you on Saturday afternoon July 20, 1996 describing syngas flaring from the initial Polk Unit 1 start up. The gasifier at Polk Unit 1 was operated on coal to produce syngas for the first time on July 19, 1996. On July 20, 1996 between 4:18 a.m. and 1:44 p.m. for approximately 9 hours raw syngas was flared from its initial start up firing greater than normal start-up flaring operation. Flaring was required for safety purposes to check for leaks due to this initial operation. Continuous flaring under these initial conditions is done to meet safety requirements and minimize emissions that would be greater by shutting down and restarting.

Instrument and pluggage problems currently being investigated caused the shut down of the plant at 1:44 p.m. on July 20, 1996. The initial start up of the plant is expected to continue on Wednesday, July 24, 1996 or when these problems are corrected. After leak testing and preliminary equipment operation is completed, flaring time for start up is expected to be significantly reduced. Please give me a call at (813) 228-4835 if you have any comments or questions.

Sincerely,

Philip J Matonte

Philip J. Matonte
Consulting Engineer
Environmental Planning

cc: Syed Arif

EP\gm\PJM053

cc: A Linero
- JR 7/30/96

Memorandum

Florida Department of
Environmental Protection

TO: Howard L. Rhodes

FROM: Al Linero Al Linero 3/2

DATE: March 2, 1995

SUBJECT: Modifications and Extension to TECO Polk Power Station (PA92-32A)

Attached for your review and approval is an amendment modifying the subject PSD permit. A final order modifying the certification conditions for the TECO Polk Power Station was signed by the Secretary's office on February 20, 1995. Through the attached, we are modifying the PSD permit to reflect those changes.

The changes consist of a date extension to the year 2000, a larger auxiliary boiler, replacement of coal piles with silos, and slightly lower NOx emissions.

This project involves construction/operation of a 260 MW combined cycle power plant which is phase 1 on an ultimate 1150 MW integrated coal gasification combined cycle facility.

AL/t

Attachments

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

February 28, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. G. F. Anderson
Tampa Electric Company
P. O. Box 111
Tampa, Florida 33601-0111

Dear Mr. Anderson:

RE: Amendment for a Modification to the Auxiliary Boiler and Expiration Date Extension PSD-FL-194(A)

The Department received your requests of May 12 and June 9, 1994, to modify the auxiliary boiler by increasing the heat input rate, which will require changing some existing specific conditions, and to extend the expiration date of the PSD permit referenced below. The permit is amended as shown:

Permit No. PA-92-32, PSD-FL-194, Tampa Electric Company.

Current Expiration Date: June 1, 1996

New Expiration Date: June 30, 2000

The Department is also modifying the specific conditions as follows:

E. Auxiliary Boiler

The maximum heat input to the auxiliary boiler shall not exceed ~~49.5~~ <u>120.0</u> MMBtu/hr when firing No. 2 fuel oil with 0.05 percent maximum sulfur content by weight. All fuel consumption must be continuously measured and recorded for the auxiliary boiler.

G. Fugitive Dust

Fugitive dust emissions during the construction period shall be minimized by covering or watering dust generation areas. Particulate <u>matter</u> emissions from the coal handling equipment shall be controlled by enclosing all <u>coal</u> <u>storage</u>, conveyors and conveyor transfer points (~~except-those-directly-associated-with-the-coal stacker/reclaimer-for-which-an-enclosure-is-operationally infeasible~~). Fugitive emissions shall be tested as specified in Condition No. J. ~~Inactive-coal-storage-shall-be-shaped,-compacted, and-oriented-to-minimize-wind-erosion.~~ Water sprays or chemical wetting agents and stabilizers shall be applied to uncovered storage piles, roads, handling equipment, etc. during dry periods and, as necessary, to all facilities to maintain an opacity of less than or equal to five percent. ~~When-adding,-moving-or-removing coal-from-the-coal-pile,-an-opacity-of-20-percent-is-allowed.~~

H. Emission Limits

1. The maximum allowable emissions from the IGCC combustion turbine, when firing syngas and low sulfur fuel oil, in accordance with the BACT determination, shall not exceed the following:

Pollutant	Fuel	Basis	Emissions Limitations 7F CT Postdemonstration Period lb/hr	tpy
NO_x	Oil	42 ppmvd	311	N/A
	Syngas	25 ppmvd	~~222.5~~ 220.25	~~1,044~~ 1,032.9

I. Auxiliary Boiler Operation

Normal operation of the auxiliary boiler shall be limited to a maximum of ~~1,000~~ 3,000 hours per year ~~and-only-during-periods-of startup-and-shutdown-of-the-IGCC-unit,-or-when-steam-from-the-IGCC unit's-heat-recovery-steam-generator-is-unavailable.~~ The auxiliary boiler may operate continuously (i.e. 8,760 hrs/yr) in the standby mode. The following emission limitations shall apply:

1. NO_x emissions shall not exceed ~~0.16~~ 0.10 lbs/MMBtu for oil firing.
2. Sulfur dioxide emissions shall be limited by firing low sulfur oil with a maximum sulfur content of 0.05 percent by weight.
3. Visible emissions shall not exceed 20 percent opacity (6-minute average) ~~(except for one six-minute period per hour during which opacity shall not exceed 27 percent)~~, while burning low sulfur fuel oil.

L. Monitoring Requirements

1. IGCC Combustion Turbine

A continuous emission monitoring system (CEMS) shall be installed, operated and maintained in accordance with 40 CFR 60, Appendix F, for the combined cycle unit to monitor nitrogen oxides and a diluent gas (CO_2 or O_2). The applicant shall request that this condition of certification be amended to reflect the Federal Acid Rain Program requirements of 40 CFR 75, if applicable, when those requirements become effective within the state.

~~1.~~ a Each CEMS shall meet the performance specifications of 40 CFR 60, Appendix B.

~~2.~~ b CEMS data shall be recorded and reported in accordance with Rule ~~Chapter~~ 62-297.500, F.A.C.;~~,~~ 40 CFR 60; and, 40 CFR 75, if applicable. The record shall include periods of startup, shutdown, and malfunction.

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

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

~~5.~~ e For purposes of the reports required under this permit, excess emissions are defined as any calculated average emission concentration, as determined pursuant to Condition No. H.4 herein, which exceeds the applicable emission limits in Condition No. H.1.

2. Auxiliary Boiler

A CEMS shall be installed, operated and maintained in accordance with 40 CFR 60, Appendix F, for the auxiliary boiler to monitor nitrogen oxides emissions and in accordance with 40 CFR 60.13 to monitor opacity.

a. The CEMS shall meet the performance specifications of 40 CFR 60, Appendix B.

b. CEMS data shall be recorded and reported in accordance with Rule 62-297.500, F.A.C., and 40 CFR 60. The record shall include periods of startup, shutdown and malfunction.

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

d. The procedures under 40 CFR 60.13 shall be followed for installation, evaluation, and operation of the CEMS.

N. Applicable Requirements

The project shall comply with all the applicable requirements of Chapters 62-212 and 62-4, F.A.C., and 40 CFR 60, Subparts A, Db and GG.

A copy of this letter shall be attached to the above mentioned permit, No. PSD-FL-194(A), and shall become a part of the permit.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes
Director
Division of Air Resources
Management

HLR/sa/b

cc: B. Thomas, SWD
J. Harper, EPA
J. Bunyak, NPS
H. Oven, PPS
T. Davis, P.E., ECT

Final Determination

The permit amendment to reflect modifications and extension of the expiration date for Tampa Electric Company's 260 MW integrated coal gasification combined cycle source, located in Polk county, Florida, was distributed on November 16, 1994. The Notice of Intent to Issue was published in the Lakeland Ledger on December 3, 1994. Copies of the amendment were available for public inspection at the Department offices in Tampa and Tallahassee.

No comments were submitted by the National Park Service, U.S. Environmental Protection Agency or the applicant.

The final action of the Department will be to issue the permit amendment as proposed.

Is your RETURN ADDRESS completed on the reverse side?

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

... to receive the following services (for an extra fee):

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

Consult postmaster for fee.

3. Article Addressed to:
G.F. Anderson
Tampa Electric Co
P O Box 111
Tampa, Fl 33601-0111

4a. Article Number
Z 311 902 951

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

7. Date of Delivery
MAR 10 1995

5. Signature (Addressee)

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

6. Signature (Agent)

PS Form **3811**, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 311 902 951

UNITED STATES POSTAL SERVICE

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

PS Form 3800, March 1993

Sent to G. F. Anderson	
Street and No. TECO	
P.O., State and ZIP Code Tampa, 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 PSD-FI-194(A) PA-92-32	3-8-95