Florida Power
CORPORATION

Environmental Services Department

FAX COVER SHEET

DATE: 6/23/98

TO: Martin Costello FAX # (850) 922-6979

COMPANY: DEP

FROM: Scott Osborn PHONE # (813) 866-5158

FAX #

NUMBER OF PAGES TRANSMITTED 3
Please call number listed above for any transmission problems.

COMMENTS:

As you requested, attached is some info on the gas burners for the Arcadia gas conversion. I will be meeting in Tallahassee on 6/30 and would like to stop by to discuss any drafts permit that you might have available for review.

(Good luck on Orimulsion!)

Scott

EPT is the project contractor. Ansaldo is the manufacturer of the burner hardware.

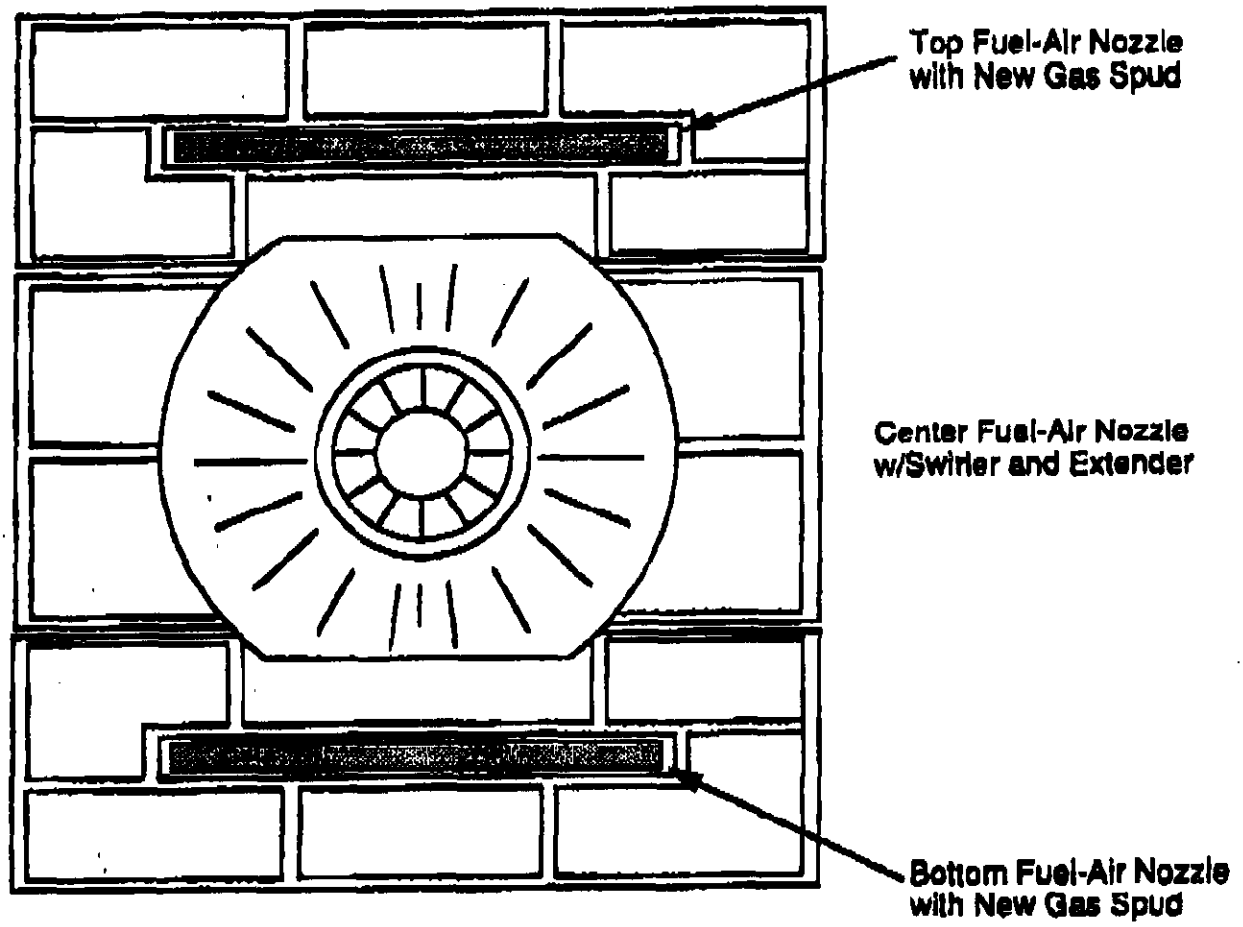

Figure 1. Schematic drawing of burner compartment showing location of new gas injector spuds in the top and bottom fuel-air nozzles (view from furnace).

At a burner gas pressure of 28 psig, heat input for each burner (2 spuds) will be at the design max. of 260 MBtu/hr.

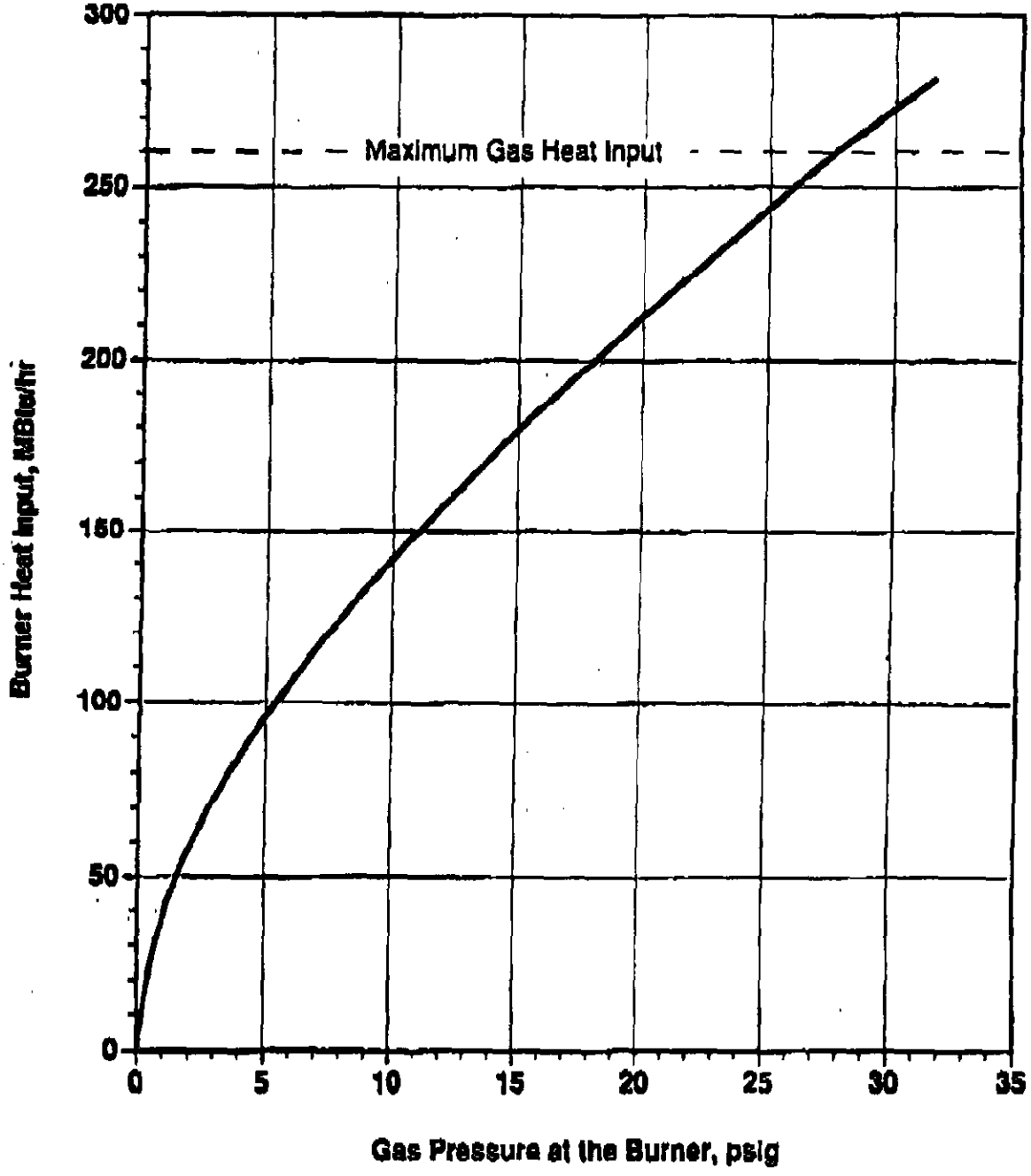

Figure 2. Gas heat input (MBtu/hr) vs. gas pressure (psig) at the burner for the gas spud design proposed for Anclote Units 1 and 2.

Florida Power
CORPORATION

RECEIVED
JUN 11 1998
BUREAU OF
AIR REGULATION

June 5, 1998

Mr. Martin Costello, P. E.
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

Dear Mr. Costello:

Re: Anclote Plant Natural Gas Conversion Project

This letter serves to provide the additional information requested by the Department, in a letter dated May 19, 1998, that will enable the above-referenced application to be processed. Florida Power Corporation (FPC) has provided responses in the order that the comments were presented in the Department's letter.

Comment- According to the letter, FPC has no plans to burn higher sulfur fuel oil than presently allowed by the operation permits (2.75 lb/MMBtu heat input equal to approximately 2.5 percent sulfur). However, the letter requests the flexibility to co-fire natural gas with No. 6 fuel oil having a sulfur content greater than 2.5 percent. Please quantify maximum levels of sulfur, nitrogen, ash and vanadium for the higher sulfur fuel oil requested.

Response- FPC is classifying this as a pollution control project because the reduction in annual SO_2 emissions caused by the burning of gas is significant to FPC's acid rain compliance strategy and further, the use of gas at low loads will lessen the potential for acid smut formation, resulting in lower opacity and reduced local deposition. For this latter reason, the DEP's Southwest District is interested in this proposed gas conversion. Its positive impact on opacity and deposition would also serve to characterize it as a pollution control project.

FPC will be limited to a fixed number of SO_2 allowances systemwide in the year 2000 and it would be counter-productive to needlessly burn higher sulfur oil that would require the purchase of additional allowances. This is especially true if the incremental cost savings of the higher sulfur fuel oil are less than the cost of additional allowances. Due to all of these considerations, FPC is willing to accept a limitation on the fuel sulfur content to no higher than the current 2.5 percent permit limit. Therefore, there is no need to quantify the levels of sulfur, nitrogen, ash and vanadium associated with a higher sulfur fuel oil than is currently permitted.

Comment- Please specify how FPC will insure continuous compliance with applicable emission limits for SO_2 and particulate matter and demonstrate there are no future significant increase while co-firing gas with higher sulfur fuel oil. Please specify co-firing ratios when firing higher sulfur fuel oil and the method used to maintain minimum gas/oil heat input ratios.

Response- Based on the response to the previous comment (i.e., FPC will accept a fuel oil sulfur content limit of 2.5 percent), there should be no concern of future significant increases while co-firing gas with higher sulfur fuel oil. The methods to be used to demonstrate continuous compliance are currently being negotiated through the Title V permitting process. As you know, the Department and EPA Region IV are currently in discussions over appropriate continuous and periodic monitoring requirements.

Comment- Quantify any projected decreases in air pollutants (e.g., particulate matter, opacity, sulfur dioxide, nitrogen oxides) as a result of this project. The prior response ("It is clear that emissions of particulate matter, opacity, sulfur dioxides carbon monoxides, and VOCs will all be substantially reduced whenever gas is burned") did not quantify emission changes associated with the project. Please explain how these emissions will be reduced from current levels when high sulfur or high ash liquids are co-fired with natural gas. Please specify any restrictions (for incorporation into the construction permit) which will ensure that "substantial" emission reductions occur and are sustained. Provide the NO_x and CO emission rates in lb/MMBtu for natural gas firing and for co-firing gas with fuel oil.

Response- FPC is aware of the Department's concern that there could potentially be no real reduction in SO_2, particulates and opacity if the 2.75 lb/MMBtu SO_2 limit were to be the only restriction on fuel oil sulfur while co-firing with gas. For example, while co-firing at a rate of 60 percent oil/ 40 percent gas at full load, FPC would essentially be able to fire fuel oil with a sulfur content as high as 4.2 percent and still comply with the 2.75 lb/MMBtu SO_2 limit. Such a high fuel sulfur content, even if co-fired with gas could result in a higher opacity and, potentially greater particulate emissions. As previously stated, any time that gas is burned, the systemwide demand for SO_2 allowances will be reduced; it would be counterproductive to burn a higher sulfur fuel oil, especially if the incremental cost savings are less than the cost of additional allowances. FPC will, therefore, agree to the incorporation of a 2.5 percent sulfur limit into the construction permit.

FPC does not currently have specific information on the NO_x and CO emission rates in lb/MMBtu for natural gas firing and for co-firing gas with fuel oil, other than to say that the vendor has guaranteed that the rates will be less while firing gas than during the baseline case of oil firing only. Based on CEMS data, the annual average NO_x values for Units 1 and 2 for 1997 were 0.321 and 0.328 lb/MMBtu, respectively. Further, annual tons per year of NOx for both units for the years 1996 and 1997 were previously supplied in correspondence to the Department, dated April 28, 1998. In addition, projected operation of both units five years into the future, both with and without gas (in terms of fuel fired, capacity factors and service hours) was provided to the Department in previous correspondence dated February 19, 1998. As an example, review the data submitted for the year 2000, the first full year that both units will be

operating on gas. It's estimated that, with the gas conversion, Units 1 and 2 would burn *less* No. 6 oil (a delta of 438,000 bbls and 642,000 bbls, respectively) *and that the capacity factor for both units would decrease*. Similar trends are exhibited out to the year 2003. FPC believes that the Department now has adequate information to allow the processing and issuance of a construction permit for this environmentally beneficial project, as reasonable assurance has been provided that emissions will not increase significantly as a result of this natural gas conversion.

Comment- Which pollutants (including opacity), if any, will undergo a collateral increase considering the co-firing of natural gas and liquids with high sulfur and/or high ash content? Please quantify these increases (future projected actual emissions and potential to emit) in terms of lb/MMBtu and tons per year.

Response- Since FPC is willing to accept a permit limit on fuel sulfur of no greater than the current limit, any time that gas is co-fired with fuel oil, there will be no collateral increase in any pollutants, including opacity. In other words, FPC will not be taking advantage of its potential ability to burn fuel oils with sulfur contents greater than 2.5 percent while co-firing with gas. With a cap on fuel sulfur, instead of the limiting standard being 2.75 lb/MMBtu, SO_2 emissions will be substantially reduced whenever gas is co-fired.

Comment- The Department is reviewing the project as described on pages 1 through 7 which is to modify Units 1 and 2 to accommodate the co-firing of natural gas with the currently permitted No. 6 oil. Most of the rest of the application is a copy of the Title V application previously prepared by Golder Associates for FPC. Issues related to used fuel oil contained in the Title V application are being addressed separately from this permitting action based on FPC's petition for an administrative hearing. This matter was discussed by Mr. Fancy and Mr. Kennedy. This approach will expedite the project to use natural gas.

Response- The above comment confirms FPC's understanding of how the used oil issue is to be considered.

If you should have any questions concerning the above, please do not hesitate to contact me at (813) 866-5158.

Sincerely,

Scott H. Osbourn
Senior Environmental Engineer

cc: Clair Fancy, DEP
Al Linero, DEP
Dave Trudel, Parsons, Inc

Department of Environmental Protection

Lawton Chiles
Governor

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

Virginia B. Wetherell
Secretary

May 19, 1998

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Re: DEP File No. 1010017-004-AC
Anclote Power Plant, Units 1 and 2
Natural Gas Firing Project

Dear Mr. Pardue:

The Department has reviewed Mr. Osbourn's letter dated April 28 in response to the Department's request for information. In order to further process the application, we need the following information:

1. According to the letter, FPC has no plans to burn higher sulfur fuel oil than presently allowed by the operation permits (2.75 lb/mmBtu heat input equal to approximately 2.5 percent sulfur). However the letter requests the flexibility to co-fire natural gas with No. 6 fuel oil having a sulfur content greater than 2.5%. Please quantify maximum levels of sulfur, nitrogen, ash and vanadium for the higher sulfur fuel oil requested.

2. Please specify how FPC will insure continuous compliance with applicable emission limits for SO_2 and particulate matter and demonstrate there are no future significant increases while co-firing gas with higher sulfur fuel oil. Please specify co-firing ratios when firing higher sulfur fuel oil and the method used to maintain minimum gas/oil heat input ratios.

3. Quantify any projected decreases in air pollutants (e.g. particulate matter, opacity, sulfur dioxide, nitrogen oxides) as a result of the project. The prior response ("It is clear that emissions of particulate matter, opacity, sulfur dioxides, carbon monoxides, and VOCs will all be substantially reduced whenever gas is burned") did not quantify emissions changes associated with the project. Please explain how these emissions will be reduced from current levels when high sulfur or high ash liquids are co-fired with natural gas. Please specify any restrictions (for incorporation into the construction permit) which will ensure that "substantial" emission reductions occur and are sustained. Provide the NO_X and CO emission rates in lb/mmBtu for natural gas firing and for co-firing gas with fuel oil.

4. Which pollutants (including opacity), if any, will undergo a collateral increase considering the co-firing of natural gas and liquids with high sulfur and/or high ash content? Please quantify these increases (future projected actual emissions and potential to emit) in terms of lb/mmBtu and tons per year.

5. The Department is reviewing the project as described on pages 1 through 7 which is to modify Units 1 and 2 to accommodate the co-firing of natural gas with the currently permitted No. 6 oil. Most of the rest of the application is a copy of the Title V application previously prepared by Golder Associates for FPC. Issues related to used fuel oil contained in the Title V application are being addressed separately from this permitting action based on FPC's petition for an administrative hearing. This matter was discussed by Mr. Fancy and Mr. Kennedy. This approach will expedite the project to use natural gas.

If you have any questions, please contact me at 850/488-1344.

Sincerely,

Martin Costello, P.E.
New Source Review Section

MC/mc/c

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
D.T. Buell, Anclote Plant Manager, FPC
Jennifer Tillman, P.E., FPC

Fold at line over top of envelope to

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. Jeffrey Pardue, ESD
Fla. Power Corp.
3201 34th St. South
St. Petersburg, Fl
33733

4a. Article Number P 265 659 351

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

7. Date of Delivery MAY 22 1998

5. Received By: *(Print Name)*

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

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

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

Is your RETURN ADDRESS completed on the reverse side?

Thank you for using Return Receipt Service.

P 265 659 351

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

Sent to Jeffrey Pardue	
Street & Number PPC	
Post Office, State, & ZIP Code St. Pete, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 5-19-98	

PS Form **3800**, April 1995

101C017-004-AC
Anclote Units 1 & 2

Florida Power
CORPORATION

April 28, 1998

Mr. Martin Costello, P.E.
Florida Department of Environmental Protection
New Source Review Section
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

Dear Mr. Costello:

Re: Anclote Power Plant (DEP File No. 1010017-004-AC)
Natural Gas Firing Project

This letter serves to provide the additional information requested by the Department, in a letter dated March 26, 1998, that will enable the above-referenced application to be processed. Florida Power Corporation (FPC) has provided responses in the order that the comments were presented in the Department's letter.

Comment- Is the project, in the opinion of FPC, a "Pollution Control Project" (PCP) as defined in 40 CFR 52.21b(2)(iii)(h)?

Response- The so-called "WEPCo Rule" makes explicit in the new source review (NSR) regulations, though only for electric utility sources, the pollution control project exclusion and extends the "not less environmentally beneficial" test to the addition and use of a pollution control project. Specifically, the WEPCo rule provides, as relevant here, that a pollution control project is not a physical or operational change "unless the Administrator determines" that the project "renders the unit less environmentally beneficial." (See 40 CFR 51.21(b)(2)(iii)(h), emphasis added). Simply put, what this is saying is that a pollution control project is excluded from NSR, except in those circumstances where, on balance, the emissions unit would cause more harm to the environment with the pollution control project than without it.

FPC believes that there is no doubt that the natural gas conversion project at Anclote Plant would result in a net environmental benefit. The emissions of particulates, sulfur dioxides, carbon monoxide, VOCs and opacity will be reduced substantially in terms of both the rate (lb/hr) and total quantities of emissions (tons/yr). The NO_x emission *rate* will be lower on gas than on No. 6 oil; although, the respective NO_x levels will need to be determined through testing once the conversion is complete. Finally, the pollution control project definition is appropriately applied here because: 1) the reduction in annual SO_2 emissions caused by the

burning of gas is significant to FPC's acid rain compliance strategy and 2) the use of gas at low loads will lessen the potential for acid smut formation, resulting in less internal corrosion, lower opacity and reduced deposition.

Comment- Provide any information which describes the primary reason for the project and other reasons for the project. Please describe when (i.e., during off-peak times when the unit is at low load) and how much gas will be used (i.e., co-fired with No. 6 oil at 40% of the heat input or fired alone at low load during off-peak times) and the overall environmental benefits. Please provide any documents (memoranda, Public Service Commission correspondence) which describe the justification for the project as a pollution control project.

Response- The primary reasons for the project are to provide fuel flexibility and to address the environmental concerns identified above. As utilities prepare for a competitive environment, fuel flexibility becomes important; however, as stated in previous correspondence to the Department (dated February 19, 1998), the Anclote units are considered to be intermediate load units. Consequently, the availability of gas, whenever it is at lower cost, would help the Anclote units be more competitive within the intermediate load category, but would not change the units' category by a significant increase in capacity factor. FPC anticipates that, at low loads, the units will be co-fired primarily on gas, although firing with gas only may be possible. At full load, as much as 40 percent of the total heat input may be supplied by gas. This maximum amount of gas is limited more by boiler design than gas availability.

The Department also requests that FPC provide any documents which describe the justification for the project as a pollution control project. The issue of acid smut formation has been discussed at length with the Department's Southwest District. Possible remedies, including the use of gas, are extensively documented in their files. Finally, FPC's acid rain compliance plan incorporates the increased use of natural gas within our generating system.

Comment- Quantify any projected decreases in air pollutants (e.g., particulate matter, opacity, sulfur dioxides, nitrogen oxides) as a result of the project.

Response- Using CEMS data, FPC had previously quantified NO_x emissions for both Anclote units for 1996 and 1997. This information was previously faxed to the Department and is provided here as an attachment. FPC's previous correspondence, dated February 19, 1998, included a detailed projection of Anclote operations in future years, both with and without gas. It is clear that emissions of particulate matter, opacity, sulfur dioxides, carbon monoxides, and VOCs will all be substantially reduced whenever gas is burned. This is true regardless of any potential increase in the capacity factor associated with systemwide demand growth. Emissions of NO_x are not projected to increase significantly and, in some future years, may actually decrease when compared to future operation without the gas conversion.

Comment- Which pollutants (including opacity), if any, will undergo a collateral increase? Please quantify these increases.

Response- This comment was addressed above.

Comment- Will the annual average ash and/or sulfur concentrations of liquid fuels (including used oil) fired at the plant be greater than the concentrations in the historical fuel as a result of co-firing either No. 6 fuel oil with higher than 2.5% sulfur content or from firing larger quantities of used oil? Attachment AN-EU1-L2 to your application indicates that the specification for ash content from used oil procured from outside sources is about nine times higher than the specification for ash content from No. 6 fuel oil (0.9 vs 0.1% ash). If the actual levels of used oil ash content is several times higher than 0.1% ash, then any used oil fired may require substantial dilution with a low ash fuel in order to avoid exceeding opacity limits.

Response- FPC currently has no plans to burn higher sulfur fuel oils when co-firing with gas, but would like the flexibility to do so if the cost savings available would be significant. Regarding used oil, FPC has not experienced an increase in opacity levels as a result of burning used oil under our current authorization and, in fact, has seen a drop in SO_2 when burning used oil (0.5% sulfur vs. 1.5-2.5% sulfur in No. 6 oil). In addition, as the amount or method of used oil to be burned is a separate issue from this proposed project (i.e., FPC currently has an air operating permit amendment that allows the burning of used oil), it was mutually agreed in a teleconference with the Department that this issue need not be further addressed with regard to this gas conversion project.

Comment- Please describe how used oil has been fired in the past. Include quantities fired per year, blending ratios, typical load levels when firing used oil, opacity changes as a result of firing used oil compared to No. 6 fuel oil, and the average and the range of actual ash and sulfur contents of used oil fired. Estimate how much used oil will be fired per year following the gas conversion.

Response- As was indicated in the response above, it was mutually agreed with the Department that issues associated with the burning of used oil need not be further addressed with regard to this gas conversion project.

If you should have any questions concerning the above, please do not hesitate to contact me at (813) 866-5158.

Sincerely,

Scott H. Osbourn
Senior Environmental Engineer

cc: Clair Fancy, DEP
Al Linero, DEP
Dave Trudel, Parsons, Inc.

cc: file
EPA
NPS
SWD

Anclote Plant
NOx Yearly Totals
(Based on CEM Hourly values - Tons)

Unit	Quarter	NOx (tons)	Yearly Total (tons)
1	1Q96	605.4	
	2Q96	1268.8	
	3Q96	1453.4	
	4Q96	712.0	4039.6
	1Q97	566.9	
	2Q97	1127.5	
	3Q97	1448.6	
	4Q97	652.6	3795.6
2	1Q96	1054.9	
	2Q96	1712.7	
	3Q96	1549.5	
	4Q96	143.3	4460.4
	1Q97	939.5	
	2Q97	979.1	
	3Q97	1491.0	
	4Q97	962.2	4371.8

prepared by:
Jennifer L. Tillman
3/25/98

PROJECTED ANCLOTE OPERATIONS WITH AND WITHOUT GAS CONVERSION

	1998		1999		2000		2001		2002		2003	
UNIT	1	2	1	2	1	2	1	2	1	2	1	2
With Gas												
Cap. Factor	34.1	36.7	24.1	34.2	25.4	31.3	34.7	35.4	25.9	37.3	34.0	33.9
Service Hrs	5653	5057	4676	5366	4345	4833	5564	5070	4834	5438	5289	4987
W/O Gas												
Cap. Factor	34.1	36.7	24.7	34.6	26.1	31.7	35.1	35.7	26.6	37.7	34.4	34.3
Service Hrs	5653	5057	4676	5366	4345	4833	5586	5075	4840	5438	5298	4989
Delta												
(with-w/o)												
Cap. Factor	0.0	0.0	-0.6	-0.4	-0.7	-0.4	-0.4	-0.3	-0.7	-0.4	-0.4	-0.4
Service Hrs.	0	0	0	0	0	0	-22	-5	-6	0	-9	-2

PROJECTED ANCLOTE FUEL CONSUMPTION WITH AND WITHOUT GAS CONVERSION

With Gas												
(000 bbls)												
Distillate	243.6	206.9	234.0	279.6	205.2	252.6	249.7	232.1	230.5	260.0	233.1	231.1
Med. Sulfur oil	2487.8	2469.4	1360.4	1537.8	1474.8	1573.0	2100.9	1885.4	1615.5	1998.0	2077.0	1967.0
(000 mcf)												
Natural Gas	0	331.8	2942.2	5677.2	2656.2	4162.1	2832.1	3739.5	2091.7	3892.4	2607.8	2555.8
W/O Gas												
(000 bbls)												
Distillate	243.6	206.9	234.0	279.6	205.2	252.6	248.8	232.1	230.5	260.0	233.1	231.1
Med. Sulfur oil	2487.8	2518.2	1837.0	2409.2	1912.9	2215.0	2554.4	2462.8	1969.2	2606.7	2494.6	2371.7
(000 mcf)												
Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0
Delta												
(000 bbls)												
Distillate	0	0	0	0	0	0	0.9	0	0	0	0	0
Med. Sulfur oil	0	-48.8	-476.6	-871.4	-438.1	-642.0	-453.5	-577.4	-353.7	-608.7	-417.6	-404.7
(000 mcf)												
Natural Gas	0	331.8	2942.2	5677.2	2656.2	4162.1	2832.1	3739.5	2091.7	3892.4	2607.8	2555.8

Projections are based on the following assumptions: Fuel Forecast FCP-9703
Demand and Energy Forecast L971201

Notes: The Anclote units are considered as intermediate units with or without the conversion to natural gas.
Based on this fuel forecast, the operation of Anclote would change very little. Medium sulfur oil is simply displaced by narural gas.

Florida Power
CORPORATION

RECEIVED
APR 13 1998
BUREAU OF
AIR REGULATION

April 8, 1998

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

Dear Mr. Holladay:

Re: Anclote Plant Stack and Building Heights

As we discussed over the telephone today, the following are the heights of the stack and the tallest building at the Florida Power Corporation (FPC) Anclote plant:

Stack Height	499 feet
Building Height	185 feet

The stack is a single stack through which both Units 1 and 2 are exhausted. The largest building is the plant powerhouse building. Using the heights given above, the stack/building height ratio is approximately 2.7. Therefore the stack is G.E.P. and no building downwash would occur.

Please feel free to contact me at (813) 866-4344 if you have any questions.

Sincerely,

J. Michael Kennedy, QEP
Manager, Air Programs

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

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

Re: DEP File No. 1010017-004-AC
Anclote Power Plant, Units 1 and 2
Natural Gas Firing Project

Dear Mr. Pardue:

The Department has reviewed your request to co-fire natural gas with No. 6 fuel oil in Anclote Units 1 and 2. In order to process the application, we need the following information:

1. Is the project in the opinion of FPC a "Pollution Conytrol Project" (PCP) as defined in 40 52.21b(2)(iii)(h)?
2. Provide any information which describes the primary reason for the project and other reasons for the project. Please describe when (i.e. during off peak times when the unit is at low load) and how much gas will be used (i.e. co-fired with No. 6 fuel oil at 40% of the heat input or fired alone at low load during off peak times) and the overall environmental benefits. Please provide any documents (memoranda, Public Service Commission correspondence) which describe the justification for the project as a pollution control project.
3. Quantify any projected decreases in air pollutants (e.g. particulate matter, opacity, sulfur dioxide, nitrogen oxides) as a result of the project.
4. Which pollutants (including opacity), if any, will undergo a collateral increase? Please quantify these increases.
5. Will the annual average ash and/or sulfur concentrations of liquids fuels (including used oil) fired at the plant be greater than the concentrations in the historical fuel as a result of co-firing either No. 6 fuel oil with higher than 2.5% sulfur content or from firing larger quantities of used oil? Attachment AN-EU1-L2 to your application indicates that the specification for ash content from used oil procured from outside sources is about nine times higher than the specification for ash content from No. 6 fuel oil (0.9 vs 0.1 percent ash). If the actual levels of used oil ash content is several times higher than 0.1 percent ash, then any used oil fired may require substantial dilution with a low ash fuel in order to avoid exceeding opacity limits.

6. Please describe how used oil has been fired in the past. Include quantities fired per year, blending ratios, typical load levels when firing used oil, opacity changes as a result of firing used oil compared to No. 6 fuel oil, and the average and the range of actual ash and sulfur contents of used oil fired. Estimate how much used oil will be fired per year following the gas conversion.

In the event that the PCP exemption does not apply, then emissions from the boilers after the addition of natural gas will be held to past actual levels since a PSD application has not been submitted for this project. If you have any questions, please contact me at 850/488-1344.

Sincerely,

Martin Costello, P.E.
New Source Review Section

MC/mc/c

cc: Brian Beals, EPA
John Bunyak, NPS
Bill Thomas, SWD
Jennifer Tillman, P.E.

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:
Mr W. Jeffrey Pardue, Director
Environmental Services
Fla. Power Corp
3201 34th St. South
St. Petersburg, Fl
33733

4a. Article Number
P 265 659 322

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

7. Date of Delivery

5. Received By: *(Print Name)*

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

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

Thank you for using Return Receipt Service.

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

P 265 659 322

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

Sent to: Jeffrey Pardue	
Street & Number: EPC	
Post Office, State, & ZIP Code: St. Pete, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 1010C17-CC4-AC 3/24/98	

PS Form **3800**, April 1995

Florida Power
CORPORATION

Environmental Services Department

FAX COVER SHEET

DATE: 3/25/98

TO: Martin Costello FAX # 850-922-6979

COMPANY: FDEP

FROM: Jennifer Tillman PHONE # 813-866-5022

FAX # 813-866-4926

NUMBER OF PAGES TRANSMITTED 2
Please call number listed above for any transmission problems.

COMMENTS:

Anclote NOx #'s.

Jennifer

Anclote Plant
NOx Yearly Totals
(Based on CEM Hourly values - Tons)

Unit	Quarter	NOx (tons)	Yearly Total (tons)
1	1Q96	605.4	
	2Q96	1268.8	
	3Q96	1453.4	
	4Q96	712.0	4039.6
	1Q97	566.9	
	2Q97	1127.5	
	3Q97	1448.6	
	4Q97	652.6	3795.6
2	1Q96	1054.9	
	2Q96	1712.7	
	3Q96	1549.5	
	4Q96	143.3	4460.4
	1Q97	939.5	
	2Q97	979.1	
	3Q97	1491.0	
	4Q97	962.2	4371.8

prepared by:
Jennifer L. Tillman
3/25/98

Florida Power
CORPORATION

Environmental Services Department

FAX COVER SHEET

DATE: 3/23/98

TO: Marty Costello FAX # (850) 922-6979

COMPANY: DEP

FROM: Scott Osborn PHONE # (813) 866-5158

FAX # - 4926

NUMBER OF PAGES TRANSMITTED 15

Please call number listed above for any transmission problems.

COMMENTS:

Marty,

Attached is the info you requested for emission guarantees and listing of changes to the Arcadia units for the gas conversion.

Jennifer & I will call you this afternoon about the key data.

Scott

PERFORMANCE PREDICTIONS, GUARANTEES, AND WARRANTIES

No exceptions are taken to the Performance Requirements contained in FPC Specification SP-6685 in Section 5.0, Section B - Technical Specification. However, EPT/Ansaldo provide the following information to clarify certain items in the Performance Requirements based on discussions with FPC at the pre-bid meeting on August 28, 1997, and in subsequent conversations with FPC.

NOx, PM, CO and Visual Opacity

A number of factors can impact emissions and opacity that are not under the direct control of the project team, and which may not be easily duplicated between the pre-outage baseline test and the post-outage acceptance test. Such factors include fuel oil properties (e.g., fuel nitrogen, coking index, and vanadium content), boiler cleanliness, main oil burner conditions, and damper and tilt positions. It is guaranteed that there will be no increase in NOx, PM, CO, and opacity compared to pre-outage levels for 100% oil firing and co-firing natural gas at MCR load, when the boiler is operated at the identical conditions, including parameters specified above and specified in FPC Specification , Section III-B, Item 5.1.

Firing Capacity and Turndown

Each gas burner will be sized for a heat input of 260 MBtu/hr. FPC Specification SP-6685 requests a burner turndown of 10:1. Based on the operating practices at the Anclote Plant, ignitors are used for flame stabilization when the heat input per elevation is ≤ 30 percent of maximum. Therefore, to meet a turndown requirement of 10:1, ignitors will be used.

Air Heater Exit Gas Temperature

No significant changes in the air heater exit gas temperature are expected when firing natural gas. However, achieving an exit gas temperature of at least 310°F at 100% MCR will depend on operating parameters beyond the project team's control, such as soot blower performance, boiler cleanliness, condition of air heater baskets,

use of steam coil air heaters, and excess oxygen. It is guaranteed that the air heater exit gas temperature will comparable to pre-outage levels when the boiler is operated at the identical conditions.

Flame Impingement

It is guaranteed that there will be no flame impingement on furnace walls from burner elevations 1 and 2 when firing gas and oil fuel. However, flame impingement caused by burners in upper elevations 3, 4, and 5 is beyond EPT's control. No changes in flame impingement are expected on these elevations following installation of gas firing equipment. However, if flame impingement with upper burner elevations is a problem at Anclote, EPT will be pleased to work with FPC to eliminate the problem.

Boiler Efficiency

It is guaranteed that the change in boiler efficiency will be less than or equal to 3.0% at 100% MCR with 44% gas co-firing, compared to 100% oil firing at identical boiler conditions. For purposes of verifying attainment of this guarantee, boiler efficiency shall be measured according to ASME PTC 4.1 - Heat Loss Method, abbreviated form, and will be based on the following conditions:

- Higher heating value of the fuel
- Ambient air temperature of 48 degrees F
- Relative humidity of 70%
- Reference air temperature equal to the air temperature at the inlet to the air heaters.

EPT and Ansaldo are willing to make predictions of changes in boiler efficiency which will result when burning gas fuel. For example, boiler efficiency compared to No. 6 oil will be lower because of increased moisture loss in the flue gas. This is an artifact of the fuel composition which is independent of burner design. However, boiler efficiency is also affected by operating parameters such as excess oxygen, steam flow and temperature, exit gas temperature, boiler cleanliness, and unburned

combustibles (i.e., carbon monoxide emissions and unburned carbon). Consequently, the methods used to measure boiler efficiency (input/output or heat loss) and the conditions at which the tests will be performed must be carefully defined. If the new gas burners meet the FPC Specification for excess oxygen and unburned combustible emissions, any changes in boiler efficiency will result from parameters beyond the control of EPT such as fuel characteristics or boiler operations.

FPC Specification SP-6685 in Section B, 12.3 (Remedies) states that a penalty will be assessed in the amount of $5,000 per 0.1% reduction in boiler efficiency below the guarantee level. EPT/Ansaldo predict that the boiler efficiency reduction at 100% MCR with 44% gas co-firing will be less than 3 percent. As an incentive, EPT/Ansaldo request that FPC consider payment of $5,000 per 0.1% increase in boiler efficiency relative to the guarantee level.

Desuperheating and Pressure Part Temperatures

In the absence of a detailed study of the thermodynamic and heat transfer characteristics of Anclote Units 1 and 2 performed by EPT/Ansaldo, and due to uncertainties in the measurement and reproducibility of steam temperature and tube metal measurements before and after the unit outages, EPT/Ansaldo can only guarantee that final superheat and reheat steam temperatures following the gas conversion and with up to 44% gas co-firing will be within ± eight (8) degrees F of the final superheat and reheat steam temperatures with 100% oil-firing at 100% MCR, compared to at the equivalent total steam flow.

Desuperheating when co-firing gas and oil fuel will be determined by the heat distribution in the furnace and boiler cleanliness, and is not within the control of the burner supplier if combustion is good. The ABB-CE study of April 15, 1997 states that the maximum desuperheater system spray capacity is 269,000 lb/hr (7.5 percent of MCR steam flow). In Ansaldo's experience, desuperheater capacity equivalent to 10 percent of MCR steam flow is typically needed for gas conversion projects from 100% oil to 100% gas. It was not possible to perform the necessary calculations in the time available to prepare this proposal to confirm the desuperheating requirements

for the Anclote gas conversion project. However, since only two elevations of gas burners are being added at Anclote, EPT and Ansaldo do not expect significant changes in desuperheating. Therefore, it is recommended that the system be retained as is, with the understanding the possibility exists that additional desuperheating capability may be required, or that increased desuperheating will be required when co-firing compared to burning oil alone.

Significant changes in pressure part temperature are also not expected. Again, this is not within the control of the burner supplier in a gas conversion project of this nature. The FPC Specification SP-6685 states that there shall be no increase in pressure part temperature. However, the ABB-CE study indicated that FPC was willing to operate Anclote Units 1 and 2 at metal temperatures on existing tubing exceeding the recommended maximums by 20°F, or less. EPT requests clarification whether FPC considers this a viable option, and if any increase in pressure part temperature is allowable. Regardless, pressure part temperatures will be determined in the pre-retrofit and post-retrofit characterization tests with the new gas burners.

EPT/Ansaldo cannot accept the ABB-CE study as a basis for guaranteeing superheat and reheat temperatures, metal temperatures, desuperheater spray flows, and boiler efficiency at intermediate loads with specified rates of gas-co-firing. If FPC requires such guarantees, then Ansaldo would have to perform the boiler heat transfer analysis that is proposed as an optional task.

Sonic Vibration

Sonic vibration of Anclote Units 1 and 2 will be measured during pre-retrofit tests (baseline) and after retrofit of the gas burners (post-retrofit tests). According to drawings provided by FPC, Anclote Units 1 and 2 are equipped with vibration baffles in the convective sections. Further, combustion calculations shows that the increase in flue gas mass flow when co-firing natural gas will be small, but may increase turbulence in the convective pass. It is guaranteed that the EPT-supplied equipment will not produce combustion-induced vibration in the furnace chamber. If unacceptable vibration occurs in the convection pass, engineering design for

modifications to vibration baffles (but not baffle materials or installation) will be provided without cost to FPC.

Sound Requirements

FPC Specification SP-6685 specifies a maximum sound level of 85 dBA within three feet of the surface of each piece of equipment supplied by EPT. To satisfy this requirement, all piping furnished will be Schedule 80. Also, the use of 6-inch diameter gas supply piping and the 6-inch Skotch valve will minimize sound levels. However, as discussed in the pre-bid meeting at the Anclote Plant, sound can propagate to the burner front from upstream valves and piping. FPC has indicated that this will be considered when measuring sound levels.

Flame Scanners

Since the original ABB-CE visible-light "fireball" detection scanner will be retained, it is possible that the flame scanners will not adequately detect gas flames at low loads even with ignitors in service (especially with gas ignitors). EPT will furnish field engineers experienced with flame scanner technology to work with FPC to optimize scanner sighting and performance. However, EPT and Ansaldo cannot be responsible for reliability of the existing flame scanner equipment.

Workmanship

All parts supplied will be designed for a minimum 20-year life, except for normal wear or critical components listed as spare parts. Consistent with the FPC Materials Terms and Conditions that was faxed to EPT from FPC on September 24, 1997, EPT warrants that equipment supplied pursuant to this project will: (a) be new, (b) conform to drawings, specifications, and terms of the FPC Purchase Order, and (c) be free from defects in design, material, and workmanship for a 12-month period after placing the equipment into service.

SECTION B

TECHNICAL SPECIFICATION

1.0 SCOPE

1.1 Description of Work

1.1.1 This Specification sets forth the technical requirements for the design, fabrication, assembly, and delivery to the jobsite of equipment and design documentation to convert the existing fuel firing system from oil firing to oil/natural gas firing at Anclote Station Units 1 and 2 of Florida Power Corporation (FPC). The conversion project is based on the installation of gas firing equipment for load carrying on the two lowest burner elevations on each steam generator. The boilers shall retain their tilting burner arrangement to adjust furnace fireball.

1.1.2 Units 1 and 2 are Combustion Engineering (CE), corner-fired, forced circulation, pressurized furnace, drum-type steam generators utilizing a total of 20 No. 6 fuel oil guns arranged on five elevations and four No. 2 light oil warmup guns on the lower elevation. All burners have light oil side ignitors. Design conditions at MCR are 2,500 psi, 1005° F at the superheater outlet, and 551 psi and 1000° F at the reheater outlet. The maximum continuous steam flow is 3,558,662 lb/h. A complete description of the plant is presented in Attachment C. The units currently burn low-sulfur (1%) No. 6 fuel oil and will co-fire high-sulfur (2-1/2%) or low-sulfur No. 6 fuel oil with natural gas in the future. The unit operates with less than 1% excess O_2 within 10% of MCR.

1.1.3 The Company will replace the existing Furnace Safeguard Supervisory System (FSSS) with a new Distributed Control Burner Management System (BMS) for each steam generator, which will include the logic necessary to burn combination of No. 6 fuel oil and natural gas. The new burner shutoff valves shall be fail in place, energize-to-open or close. Only one fuel will be burned in each burner compartment at one time.

1.2 Equipment, Material, and Services to be Supplied by the Manufacturer

1.2.1 Base Proposal:

Each unit shall require the following components, as a minimum, to complete this modification to its tilting tangential firing system:

1. Eight permanently mounted, but tiltable, main load-carrying natural gas nozzle assemblies and auxiliaries, including:

   a. Eight assembled double block and vent valve trains.

   b. Piping between the double block and vent valves and the burners including supports, and flexible hoses.

   c. Two vent valves for venting the common vent header.

2. All necessary material to incorporate natural gas nozzle assemblies into the existing boiler windbox, including new nozzle tips, and straightening-vanes, for fuel compartments.

3. Tilt components required to accommodate new gas equipment, such as pivot pins, bearing, linkages, platework, hardware, and fasteners, etc., to allow reuse of existing burner tilt drive.

4. One complete set of special tools required for installation, maintenance, testing, or operation.

5. Engineering services as follows:

   a. Integration of existing No. 6 and No. 2 fuel oil guns and new gas nozzles and piping with the existing oil gun retracting mechanisms, tilting assemblies, windbox, waterwall, and nozzle tips.

   b. Preparation of design drawings locating the new burner double block and vent valves and interconnecting piping to the burner components including all necessary field verification to prevent interferences with existing structures, equipment, piping and wiring.

   c. Written description of operating logic with interlocks and design input necessary to operate the boiler according to burner Manufacturers' recommendations in accordance with NFPA-8502 for the new burner equipment supplied. The existing ABB-CE visible light scanners will not detect individual gas burner flame, but will detect furnace fireball flame when the respective elevation is above approximately 30% heat input.

   d. Design, modeling, calculations, and testing as required to demonstrate and guarantee:

      1) The maximum ratio limits of co-firing natural gas and oil over the entire load range shall be as defined in attached ABB-CE Study 11090497 to prevent pressure part overheating without any pressure part modification.

      2) Sonic vibration not any higher than the present levels will not occur in any boiler area as a result of the conversion. (The noise level is not currently a problem). Manufacturer shall provide baffling designs and engineering as required to eliminate the vibration.

      3) Gas nozzle piping, valves, and component vibration shall not occur at any load points. Gas flow noise shall not exceed 85 dBA at 3 feet outside of the windbox.

      4) The fuel-firing equipment shall perform as specified, meeting heat release and turndown requirements with no adverse effect on existing performance capabilities.

5) The fuel-firing equipment shall meet the specified emissions performance guarantees.

6) Tilting burner nozzles and tips shall have a two year minimum life..

e. Services of a qualified field representative, as specified in Paragraph 10.0.

f. Drawings and documentation, as specified in Paragraph 4.0.

g. Startup, test, and operating procedures, as specified in Paragraph 4.2.

h. Training, as specified in Paragraph 11.0.

i. System description of all systems.

ATTACHMENT A - EQUIPMENT DATA
FLORIDA POWER CORPORATION
ANCLOTE STATION - UNITS 1 AND 2

PARSONS POWER GROUP, INC. GAS CO-FIRING BURNER ADDITION

(BIDDER'S NAME)

One copy of this form shall be returned with the bid, with all blanks filled in.

(QUOTATION NUMBER)

A.	**NATURAL GAS BURNERS**		
1.	Model		
2.	Quantity Tips per Fuel Compartment		
3.	Heat Output	MMBtu	
4.	Gas Consumption	scfh	
5.	Required Gas Pressure	psig	
6.	Design Turndown		
7.	Pipe Size Leaving Windbox	in	
8.	Flexible Hoses:		
a.	Quantity per Burner		
b.	Diameter	in	
c.	Length	in	
d.	End connection type		
9.	Total Quantity of Burners Supplied per Unit		
10.	Acceptable Gas Pressure Fluctuations	psi; sec	
B.	**NATURAL GAS VALVE TRAIN**		
1.	Double Block and Vent Valves:		
a.	Manufacturer		
b.	Model		
c.	Type		
2.	Size	in	
3.	ANSI Pressure Class		
4.	Type of End Connections:		
a.	Gas inlet and outlet		
b.	Vent		

ATTACHMENT A - EQUIPMENT DATA
FLORIDA POWER CORPORATION
ANCLOTE STATION - UNITS 1 AND 2

PARSONS POWER GROUP, INC. GAS CO-FIRING BURNER ADDITION

(BIDDER'S NAME)

5. Material:
   a. Trim ASTM
   b. Body ASTM
6. Operator:
   a. Type
   b. Manufacturer
   c. Model
7. Solenoid Valve:
   a. Manufacturer
   b. Model
8. Limit Switches:
   a. Manufacturer
   b. Model
9. Quantity Supplied per Unit:

C. **MAIN GAS VENT VALVES**

1. Valves:
   a. Manufacturer
   b. Model
   c. Type
2. Size in
3. ANSI Pressure Class
4. Type of End Connections:
   a. Gas inlet and outlet
   b. Vent
5. Material:
   a. Trim ASTM
   b. Body ASTM
6. Operator:
   a. Type

ATTACHMENT A - EQUIPMENT DATA
FLORIDA POWER CORPORATION
ANCLOTE STATION - UNITS 1 AND 2

PARSONS POWER GROUP, INC. GAS CO-FIRING BURNER ADDITION

(BIDDER'S NAME)

b. Manufacturer _____

c. Model _____

7. Solenoid Valve:

a. Manufacturer _____

b. Model _____

8. Limit Switches:

a. Manufacturer _____

b. Model _____

9. Quantity Supplied _____

D. **BURNER COMPONENTS**

1. Describe which burner tips must be changed?

2. Fully describe all other windbox components that will be supplied and are necessary to the installation of the gas burners.

E. **IGNITORS AND ACCESSORIES (OPTION)**

1.	Model		_____	_____
2.	Heat Output	MMBtu/h	_____	_____
3.	Fuel Oil Consumption	lb/h	_____	_____
4.	Required Fuel Oil Pressure at valve train	psig	_____	_____
5.	Fuel Oil Operating Viscosity Range	ssu	_____	_____
6.	Atomizing Air Pressure Range	psig	_____	_____
7.	Atomizing Air Consumption at valve train	lb/h	_____	_____
8.	Combustion Air Required (from fan)	scfm	_____	_____
9.	Cooling Air Requirements	psig/scfm	_____	_____

ATTACHMENT A - EQUIPMENT DATA
FLORIDA POWER CORPORATION
ANCLOTE STATION - UNITS 1 AND 2

PARSONS POWER GROUP, INC. GAS CO-FIRING BURNER ADDITION

(BIDDER'S NAME)

10.	Total Number Supplied per elevation		
11.	Hoses:		
	a. Type		
	b. Length	in	
	c. Diameter	in	
12.	Quick Disconnects:		
	a. Manufacturer		
	b. Model		
	c. Size		
13.	Oil Flow Control Valve: (if required)		
	a. Manufacturer		
	b. Model		
	c. Size	in	
14.	Oil Shutoff Valve: (if required)		
	a. Manufacturer		
	b. Model		
	c. Size	in	
15.	Atomizing Air Valve: (if required)		
	a. Manufacturer		
	b. Model		
	c. Size	in	
16.	Air and Oil Isolation Valves: (if required)		
	a. Manufacturer		
	b. Model		
	c. Size	in	
17.	Air and Oil Pressure Gages: (if required)		
	a. Manufacturer		
	b. Model		

ATTACHMENT A - EQUIPMENT DATA
FLORIDA POWER CORPORATION
ANCLOTE STATION - UNITS 1 AND 2

PARSONS POWER GROUP, INC. GAS CO-FIRING BURNER ADDITION

(BIDDER'S NAME)

18. Ignitor Spark Ignition System: (if required)

a.	Spark Type		
b.	Energy Release/Frequency	Joules/cps	
c.	Cooling Air Required	scfm	
d.	Equipment Temperature Limit	°F	
e.	Spark Ignition Rod Clearance	in	
f.	Removal Clearance	in	
g.	Ignition Cable:		
	1) Voltage rating	V dc	
	2) Temperature rating	°F	
	3) Insulation material		
	4) Limitation on length	ft	
	5) Manufacturer		

F. **MISCELLANEOUS INSTRUMENTATION**

1. Gas Burner Pressure Gages:

a.	Manufacturer	
b.	Model	
c.	Quantity	

2. _____:

a.	Manufacturer	
b.	Model	
c.	Quantity	

3. _____:

a.	Manufacturer	
b.	Model	
c.	Quantity	

ATTACHMENT A - EQUIPMENT DATA
FLORIDA POWER CORPORATION
ANCLOTE STATION - UNITS 1 AND 2

PARSONS POWER GROUP, INC. GAS CO-FIRING BURNER ADDITION

(BIDDER'S NAME)

G. **GUARANTEED PERFORMANCE VALUES WITH MAXIMUM ALLOWABLE RATIO OF GAS CO-FIRING WITH OIL AT MCR (as referenced to baseline test numbers)**

a.	No_x (lb/MMBtu)	(% change ±) _____
b.	Particulate (lb/MMBtu) ,	(% change ±) _____
c.	Visual Opacity %	(% change ±) _____
d.	CO (corrected to 3% O_2) ppm	(% change ±) _____
e.	O2 %	(% change ±) _____
f.	Boiler efficiency %	(% change ±) _____

H. **ONSITE TRAINING:**

1. Duration
   a. Number of Days _____
   b. Number of Classes per day _____
2. Number of Copies of Training Material Provided _____
3. Number of Instructors Provided _____
4. Attach a description of the scope of the training program.

I. **LIST OF SUB-SUPPLIERS. INCLUDE ENGINEERING, TESTING, AND MANUFACTURING ORGANIZATIONS AND RESPONSIBLE PERSONNEL.**

Name	Address	Scope