Progress Energy

January 23, 2007

(Sent by Electronic Mail-Return Receipt Requested)

Mr. Jeffery F. Koerner, P.E.
North Permitting Administrator
Florida Department of Environmental Protection
Division of Air Resource Management
2600 Blair Stone Rd., MS 5500
Tallahassee, Florida 32399

RE: Request for Additional Information No. 2
Project Number 0170004-016-AC (PSD-FL-383)
Flue Gas Desulfurization Project

Dear Mr. Koerner:

Regarding the Department's December 12, 2006 Request for Additional Information (RAI) related to Progress Energy Florida's (PEF) September 5, 2006 air application for the above-referenced project, the following responses (in bold italic type) are provided:

1. Low-NOx Burners (LNB)

Based on the vendor guarantee of 200 ppmvd for CO levels from the new low-NOx burners (LNB), the additional information estimated equivalent CO emissions of 0.197 lb/MMBtu assuming 6% oxygen in the flue gas. However, page 6 of the vendor's LNB specifications (Appendix B-2) indicates that oxygen will be reduced from 3.5% to 2.3% - 2.4%. Also, page 9 of this document indicates oxygen levels of 2.5%. Please estimate CO emissions (lb/MMBtu) assuming an oxygen level of 2.5%.

The Department's statement "page 6 of the vendor's LNB specifications (Appendix B-2) indicates that oxygen will be reduced from 3.5% to 2.3% - 2.4%" mischaracterizes what is truly stated in this section. This section of the specifications is entitled "BACKGROUND" and is discussing historical actions that have been taken to reduce NOx emissions from the boilers to address Acid Rain Program NOx emissions requirements and more accurately describes that oxygen levels in the boiler were reduced from design levels "to approximately 2.3 - 2.4%" in order to reduce NOx emissions rates. A portion of the intent in performing this LNB project is to be able to reduce NOx emissions without the need to operate the boilers outside of their normal design criteria. Also, please note that these excess oxygen levels are those measured within the boiler and not in the stack. Oxygen levels measured in the stack typically ranges around 6% (reference oxygen measurements taken during annual stack testing included in Attachment 1) as noted in PEF's previous calculations. The slight increase in oxygen levels between the boiler and the stack is due to inleakage and infiltration of air into the flue gas stream in the ductwork and equipment found between these two points.

The Department also references the following: "...page 9 of this document indicates oxygen levels of 2.5%." What Section 7.1 (PERFORMANCE GUARANTEES) of the document actually states is "Excess O_2 levels shall not be less than 2.5%" (emphasis added). The intent of this requirement in the "guarantees" section of this specification is to insure that, post-LNB changeout that the boiler will be allowed to operate in a more normal design range (i.e., higher oxygen levels). In follow-up correspondence with the vendor, they have indicated that the guarantees sited in the above reference document were based on an assumption of 3% excess O_2 in the boiler.

Progress Energy Florida, Inc.
Crystal River Steam Plant
15760 W. Powerline Street
CN77
Crystal River, FL 34428

PEF still believes that the 6% oxygen level used in the previous calculation is appropriate; however, in order to fully respond to the Department's request above, the estimate of CO emissions assuming an oxygen level of 2.5% would be 0.16 lb/MMBtu.

2. Sulfuric Acid Mist

The additional information submitted did not provide the requested list of similar recent projects that were subject to BACT determinations for SAM emissions. Please provide this list and identify the BACT limits and effective control efficiency for each project. In addition, identify the projects where controls were retrofit to an existing unit.

A summary of recent BACT determinations for SAM emissions from coal-fired electric steam generating units is provided as Table RAI 2-1 to this letter (Attachment 2). It should be noted that, with the exception of one facility (Brandon Shores Units 1 and 2 located in Ann Arundel County Maryland), all of the previous determinations listed are for new facilities. The new facilities primarily utilize either wet ESP technology or dry FGD with very low sulfur sub-bituminous coals. In contrast, Brandon Shores serves as a good comparison to the Crystal River project, as it's an existing facility being retrofit with FGD systems; SCR was previously added when the pollution control exemption was still available. Brandon Shores consists of two nominal 700 MW units using compliance coal to meet the requirements of the NSPS in 40 CFR Part 60 Subpart D, as does Crystal River. There are only a handful of similar existing facilities throughout the U.S. that meet the NSPS in Subpart D using compliance coal. For Brandon Shores, sorbent injection was proposed to the Maryland Department of the Environment as BACT for SAM since wet ESP technology is not cost effective and sorbent injection provides a cost effective solution to minimize SAM emissions to the greatest extent practicable for existing units. This technology has been added to numerous existing units to minimize SAM emissions, but under the pollution control exemption. For example, over 13 units amounting to over 8,000 MW have installed SBS injection technology to minimize SAM. However, these installations were within the window when the PSD pollution control exemption was valid. Although the permitting of Brandon Shores is still in progress the MDE has been receptive to the use of sorbent injection as BACT. Sorbent injection technology, which includes ammonia injection, in combination with the FGD will achieve about 90 percent reduction of SAM for the Crystal River Plant.

3. Maximum Heat input Rate

The additional information included the original vendor's "Utility Boiler Performance Summary". In this table under "Predicted Performance ", the fuel input is identified, but we are unable to read the units. Please review and provide the units for the fuel input term as well as the fuel input levels.

It appears that the units in the table are "MKB/HR". While we are unsure as to the specific intent of this term, it seems to make sense that this term is intended to approximate "MMBtu/Hr", as the values listed are in the range that would be expected for this parameter.

4. Miscellaneous

The additional information provides a detailed process flow diagram that identifies the boiler and equipment, fuel feeds, pollution controls, injection points, CBO units, stacks, CEMS, exhausts, and solid/liquid discharges. For this project, please identify the short-term and long-term water consumption needs for the FGD system. Also identify any new water consumption needs and estimated quantities resulting from this project.

The only short term water consumption needs associated with this project would be related to water needed to support construction activities. Long-term water consumption increases related to the project are primarily associated with the operation of the scrubber (limestone slurry preparation, gypsum

washing, etc.). The majority of the water consumed in the process is lost to evaporation (up the stack), as well as in the product gypsum and wastewater blowdown from the process. Under a separate request (currently being processed through the Siting Office, in conjunction with the Southwest Florida Water Management District), PEF is requesting an increase of 5.4 million gallons per day of additional water supply to support the clean air projects at the Crystal River site. An overall site water balance, including water needs related to the proposed air pollution control projects, is included as Attachment 3.

As these responses don't represent any material changes to the air application, it is not necessary to include new certification statements by the professional engineer or the authorized representative or responsible official. If you have any questions regarding these responses or need additional information, please contact Dave Meyer at Dave.Meyer@pgnmail.com or (727) 820-5295.

Sincerely,

Bernie M. Cumbie
Plant Manager/Responsible Official

Attachments

Electronic copies provided to the following:

Mr. Dave Meyer, Progress Energy Florida, Inc. (DAVE.MEYER@PGNMAIL.COM)
Mr. Scott Osbourn, P.E., Golder Associates, Inc. (SOSBOURN@GOLDER.COM)
Ms. Mara Nasca, SWD Office (MARA.NASCA@DEP.STATE.FL.US)
Mr. Gregg Worley, EPA Region 4 (WORLEY.GREGG@EPAMIAL.EPA.GOV)
Mr. Dee Morse. NPS (DEE_MORSE@NPS.G-QV)

Attachment 1

(Excerpts from Annual Particulate Stack Test Report 2001-2005)

Table 1 Particulate Emission Summary
Florida Power Corporation
Crystal River North Plant – Units 4&5 (ID Number 0170008)
Crystal River, Florida
August 16 & 17, 2001

Run Number	Time	Flow Rate		Stack Temp	Moisture	Oxygen	Emission Rate	
		Actual (ACFM)	Standard (SCFMD)	°F	%	%	Actual (lbs/MMBTU)	Allowable (lbs/MMBTU)
Unit 4 (EU 004)	August 16, 2001 -- Soot Blowing Mode							
1	1020-1138	2342580	1507409	297	7.9	6.5	0.0128	0.1
2	1153-1301	2364162	1520014	299	7.8	6.4	0.0118	0.1
3	1310-1417	2377187	1526941	300	7.8	6.4	0.0134	0.1
Average		2361310	1518121	299	7.8	6.4	0.0127	0.1
Unit 5 (EU 003)	August 17, 2001 -- Soot Blowing Mode							
1	1000-1107	2330326	1495119	299	8.0	6.5	0.0150	0.1
2	1120-1227	2332957	1501369	299	7.8	6.6	0.0115	0.1
3	1240-1346	2335613	1502735	298	7.8	6.6	0.0125	0.1
Average		2332965	1499741	299	7.9	6.6	0.0130	0.1

Table 1 Particulate Emission Summary
Florida Power
Crystal River North Plant - Units 4&5 (ID Number 0170008)
Crystal River, Florida
September 3 and 4, 2002

			Flow Rate					Emission Rate	
Run Number	Date	Time	Actual (ACFM)	Standard (SCFMD)	Stack Temp °F	Moisture %	Oxygen %	Actual lbs/MMBTU	Allowable lbs/MMBTU
Unit 4 (EU 004)									
1	9/3/02	0934-1041	2363149	1517231	298	8.1	6.8	0.0121	0.1
2	9/3/02	1052-1159	2349327	1507413	299	8.0	6.5	0.0141	0.1
3	9/3/02	1209-1316	2359438	1495104	300	9.1	6.7	0.0120	0.1
Average			2357305	1506583	299	8.4	6.7	0.0127	0.1
Unit 5 (EU 003)									
1	9/4/02	0935-1042	2328353	1511462	290	8.0	6.5	0.0109	0.1
2	9/4/02	1050-1157	2325121	1504553	293	8.0	6.7	0.0138	0.1
3	9/4/02	1205-1312	2329284	1510265	295	7.5	6.5	0.0128	0.1
Average			2327586	1508760	293	7.8	6.6	0.0125	0.1

Table 1 Particulate Emission Summary
Progress Energy Florida
Crystal River North Plant - Unit 4 & 5 (ID Number 0170004)
Crystal River, Florida
August 12 and 13, 2003

			Flow Rate					Emission Rate	
Run Number	Date	Time	Actual (ACFM)	Standard (SCFMD)	Stack Temp °F	Moisture %	Oxygen %	Actual lbs/MMBTU	Allowable lbs/MMBTU
Unit 4 (EU 004)									
1	8/13/03	0940-1046	2338682	1488353	302	8.4	7.2	0.0071	0.1
2	8/13/03	1105-1208	2331959	1475299	305	8.3	7.4	0.0096	0.1
3	8/13/03	1220-1325	2340201	1475032	306	8.7	7.0	0.0144	0.1
Average			2335947	1479561	304	8.5	7.2	0.0104	0.1
Unit 5 (EU 003)									
1	8/12/03	1045-1151	2341513	1499410	298	8.1	9.1	0.0219	0.1
2	8/12/03	1211-1315	2357027	1502768	300	8.2	7.4	0.0283	0.1
3	8/12/03	1325-1429	2361114	1507410	298	8.4	7.3	0.0174	0.1
Average			2353218	1503196	299	8.2	7.9	0.0225	0.1

GENERAL DATA

Plant :	PROGRESS ENERGY CRYSTAL RIVER				
Source/Unit :	UNIT 4				
Date :	JUNE 15, 2004		Cp :	0.840	
Stack dia. :	308.00	inch OR :	Duct Length :	0.00	inch
Oxygen Corr.:	0.0	percent	Duct Width :	0.00	inch
CO2 Corr. :	0.0	percent	Std. Temp. :	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U F Process Wt.

Hydrogen,wt% :	0.00	Run 1 :	0 Tons/hr
Carbon, wt% :	0.00	Run 2 :	0
Sulfur, wt% :	0.00	Run 3 :	0
Nitrogen,wt% :	0.00		
Oxygen, wt% :	0.00		
Btu/lb :	0		

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 2	RUN 3	RUN 4
Meter Temp., Tm (F)	80	80	80
Stack Temp., Ts (F)	301	302	303
Sq.Rt. dP	1.06	1.07	1.06
dH (in. H2O)	2.18	2.21	2.18
Meter Vol.,Vm (ft3)	50.902	51.921	51.264
Vol. H2O, Vlc (ml)	108.0	105.0	96.0
Meter Y	1.000	1.000	1.000
Bar. Press.,Pb (in.Hg.)	29.80	29.80	29.80
Static Press.,Ps (in.H2O)	-2.40	-2.40	-2.40
Test Time (min.)	60.0	60.0	60.0
Nozzle Dia.,Dn (in.)	0.234	0.234	0.234
Oxygen, O2 (%)	6.5	6.0	6.0
Carbon Dioxide, CO2 (%)	12.0	12.7	12.5
Carbon Monoxide, CO (%)	0.0	0.0	0.0
Report Emission Criteria in ? l = lb/hr g = gr/dscf :			grams
Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min:			T
Allowable Particulate Matter Concentration .....:			0

LABORATORY RESULTS	RUN 2	RUN 3	RUN 4
	grams	grams	grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.03320	0.03660	0.02510
Filterable Sample (MF)	0.01890	0.01870	0.02260
Condensible Sample (BHW)	0.00000	0.00000	0.00000

GENERAL DATA

Plant :	PROGRESS ENERGY - CRYSTAL RIVER				
Source/Unit :	UNIT 5				
Date :	JUNE 16, 2004		Cp :	0.840	
Stack dia. :	308.00	inch OR :	Duct Length :	0.00	inch
Oxygen Corr.:	0.0	percent	Duct Width :	0.00	inch
CO2 Corr. :	0.0	percent	Std. Temp. :	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U F Process Wt.

Hydrogen,wt% :	0.00	Run 1 :	0 Tons/hr
Carbon, wt% :	0.00	Run 2 :	0
Sulfur, wt% :	0.00	Run 3 :	0
Nitrogen,wt% :	0.00		
Oxygen, wt% :	0.00		
Btu/lb :	0		

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	76	82	85
Stack Temp., Ts (F)	302	307	310
Sq.Rt. dP	1.07	1.07	1.07
dH (in. H2O)	2.21	2.20	2.18
Meter Vol.,Vm (ft3)	52.050	52.105	52.870
Vol. H2O, Vlc (ml)	106.0	106.0	99.0
Meter Y	1.000	1.000	1.000
Bar. Press.,Pb (in.Hg.)	30.01	30.01	30.01
Static Press.,Ps (in.H2O)	-1.10	-1.10	-1.10
Test Time (min.)	60.0	60.0	60.0
Nozzle Dia.,Dn (in.)	0.234	0.234	0.234
Oxygen, O2 (%)	6.5	6.0	6.0
Carbon Dioxide, CO2 (%)	11.5	12.3	12.2
Carbon Monoxide, CO (%)	0.0	0.0	0.0
Report Emission Criteria in ? l = lb/hr g = gr/dscf :			grams
Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min:			T
Allowable Particulate Matter Concentration .....:			0

LABORATORY RESULTS	RUN 1 grams	RUN 2 grams	RUN 3 grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.10010	0.04810	0.03280
Filterable Sample (MF)	0.03820	0.03580	0.03400
Condensible Sample (BHW)	0.00000	0.00000	0.00000

GENERAL DATA

Plant	:	PROGRESS ENERGY - CRYSTAL RIVER				
Source/Unit	:	UNIT 4				
Date	:	JUNE 27, 2005		Cp	0.840	
Stack dia.	:	308.00	inch OR :	Duct Length	0.00	inch
Oxygen Corr.	:	0.0	percent	Duct Width	0.00	inch
CO2 Corr.	:	0.0	percent	Std. Temp.	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U f Process Wt.

Hydrogen, wt%	: 0.00	Run 1 :	0 Tons/hr
Carbon, wt%	: 0.00	Run 2 :	0
Sulfur, wt%	: 0.00	Run 3 :	0
Nitrogen, wt%	: 0.00		
Oxygen, wt%	: 0.00		
Btu/lb	: 0		

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	101	109	112
Stack Temp., Ts (F)	306	307	308
Sq.Rt. dP	1.10	1.11	1.11
dH (in. H2O)	1.51	1.57	1.59
Meter Vol., Vm (ft3)	44.700	46.548	46.722
Vol. H2O, Vlc (ml)	83.0	85.0	82.0
Meter Y	0.995	0.995	0.995
Bar. Press., Pb (in.Hg.)	30.40	30.40	30.40
Static Press., Ps (in.H2O)	-0.75	-0.75	-0.75
Test Time (min.)	60.0	60.0	60.0
Nozzle Dia., Dn (in.)	0.214	0.214	0.214
Oxygen, O2 (%)	5.5	5.7	6.0
Carbon Dioxide, CO2 (%)	8.0	7.5	8.3
Carbon Monoxide, CO (%)	0.0	0.0	0.0

Report Emission Criteria in ? 1 = lb/hr g = gr/dscf : grams

Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min: T

Allowable Particulate Matter Concentration : 0

LABORATORY RESULTS	RUN 1	RUN 2	RUN 3
	grams	grams	grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.01300	0.01580	0.01010
Filterable Sample (MF)	0.00830	0.00530	0.00460
Condensible Sample (BHW)	0.00000	0.00000	0.00000

GENERAL DATA

Plant	:	PROGRESS ENERGY - CRYSTAL RIVER				
Source/Unit	:	UNIT 5				
Date	:	JUNE 28, 2005		Cp	0.840	
Stack dia.	:	308.00 inch	OR :	Duct Length	0.00	inch
Oxygen Corr.	:	0.0 percent		Duct Width	0.00	inch
CO2 Corr.	:	0.0 percent		Std. Temp.	68	F

FUEL ANALYSIS DATA, (By F Factor or Fuel Use)

F Factor = F, Fuel Use = U f Process Wt.

Hydrogen, wt%	: 0.00	Run 1 :	0 Tons/hr
Carbon, wt%	: 0.00	Run 2 :	0
Sulfur, wt%	: 0.00	Run 3 :	0
Nitrogen, wt%	: 0.00		
Oxygen, wt%	: 0.00		
Btu/lb	: 0		

Type of Flow Meter : (1=Meter Box 2=Mass Flow Meter) 1

F-Factor : dscf/MMBtu;

FIELD DATA METHOD 5	RUN 1	RUN 2	RUN 3
Meter Temp., Tm (F)	100	108	110
Stack Temp., Ts (F)	295	297	299
Sq.Rt. dP	1.09	1.12	1.09
dH (in. H2O)	1.66	1.85	1.73
Meter Vol., Vm (ft3)	43.612	46.900	45.200
Vol. H2O, Vlc (ml)	76.0	81.0	84.0
Meter Y	1.000	1.000	1.000
Bar. Press., Pb (in.Hg.)	30.42	30.42	30.42
Static Press., Ps (in.H2O)	-0.78	-0.78	-0.78
Test Time (min.)	60.0	60.0	60.0
Nozzle Dia., Dn (in.)	0.214	0.214	0.214
Oxygen, O2 (%)	3.7	3.5	3.2
Carbon Dioxide, CO2 (%)	10.0	10.5	9.7
Carbon Monoxide, CO (%)	0.0	0.0	0.0

Report Emission Criteria in ? l = lb/hr g = gr/dscf : grams

Process Rate Units ? T = Ton/hr, L = Lbs/hr, C = Cans/min: T

Allowable Particulate Matter Concentration ..... : 0

LABORATORY RESULTS	RUN 1 grams	RUN 2 grams	RUN 3 grams
GRAVIMETRIC ANALYSIS METHOD 5 :			
Front Half Wash (FHW)	0.01430	0.01400	0.02060
Filterable Sample (MF)	0.00570	0.00570	0.00520
Condensible Sample (BHW)	0.00000	0.00000	0.00000

Attachment 2
(Sulfuric Acid Mist Table RAI 2-1)

TABLE RAI 2-1
SULFURIC ACID MIST EMISSIONS RATES FROM RECENT COAL-FIRED PROJECTS

Project	Plant Size MW	Heat Input MMBtu/hr	Controlled SAM lb/MMBtu	Comments
Brandon Shores Units 1 and 2	1,400	14260	0.027	Existing Unit, Sorbent Injection
Thoroughbred - Kentucky	1,500	14,886	0.00497	New Unit, WESP
Louisville Gas & Electric - Kentucky	750	6,942	0.00383	New Unit, WESP
Prairie State-Illinois	1,500	14,900	0.005	New Unit, WESP
Elm Road-Wisconsin	1,230	12,360	0.01	New Unit, WESP
Longview-West Virginia	600	6,114	0.0075	New Unit; Dry sorbent injection, no WESP
City Public Service-Texas	750	8,000	0.0037	New Unit, Wet FGD; no WESP
Public Service of Colorado	750	7,421	0.0042	New Unit; PRB Coal; no WESP
Public Service Corp Wausau - Wisconsin	500	5176	0.005	New Unit, FGD
Southwest Springfield - Missouri	275	2725	0.000184	New Unit, DLS/SDA-PRB Coal
Omaha Public Power - Nebraska	660	NA	0.0042	New Unit, DLS/SDA-PRB Coal
Xcel Energy - Colorado	750	7421	0.0042	New Unit, Dry FGD
Bull Mountain - Montana	780	8026	0.0064	New Unit, Dry FGD
Intermountain Power Service - Utah	950	9050	0.0044	New Unit, Dry Lime Scrubber
Springerville Generating Station Units 3 and 4 - Arizona	800	8400	See Comment	Facility Emission CAP Units 1, 2, 3, and 4. 211 tpy, SDA
MidAmerican Energy - Iowa	750	-	0.00421	New Unit, Dry Lime Scrubber
Montana Dakota Utilities - North Dakota	220	2,116	0.0029	6.14 lb/hr, New Unit
KCP&L - Missouri	850	7,800	0.0072	New Unit

Attachment 3
(Proposed Site Water Balance – Annual Agerage)

Progress Energy Florida, Inc. Site Certification PA77-09 Modification - Proposed Site Water Balance Annual Average (Includes non-certified areas)