



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Charlie Crist
Governor

Jeff Kottkamp
Lt. Governor

Michael W. Sole
Secretary

April 18, 2008

Electronically Sent – Received Receipt Requested

Mr. David M. Lukcic
Manager of Environmental Programs
Tampa Electric Company
P.O. Box 111
Tampa, Florida 33601-0111

RE: Application for Authorization to Construct Eight Simple Cycle Combustion Turbines and Two Emergency Generator Diesel Engines
Project No. 0570040-024-AC/PSD-FL-399
H. L. Culbreath Bayside Power Station

Dear Mr. Lukcic:

On March 20, 2008, the Department of Environmental Protection (Department) received a request for authorization to construct eight simple cycle combustion turbines and two emergency generator diesel engines. Based on our review of the proposed project, we have determined that the following additional information is needed in order to continue processing this application package. Please provide all assumptions, calculations, and reference materials, that are used or reflected in any of your responses to the following issues:

1. What was the environmental bid specification for each pollutant that was provided to the simple cycle combustion turbine (CT) vendors to evaluate for bid submittals? Also, provide the vendor's quotes and guarantees.
2. What is the actual cost of each individual simple cycle CT system? What is the actual cost of each associated electrical generator?
3. What is the total cost for the overall proposed project?
4. Are you planning to convert these simple cycle CT systems into combined cycle CT systems? If so, when?
5. What are the maximum uncontrolled NOx emissions (ppm) from one of the proposed simple cycle CT systems? Based on the uncontrolled emissions for one simple cycle CT, provide a top-down detailed equipment requirement and cost effectiveness analysis to bring the NOx emissions down to 2.5 ppmvd @ 15% oxygen? Please address the question using only SCR, water injection plus SCR, and dry low-NOx combustors (DLNC) plus SCR.
6. What is the amount of additional power output [megawatts (MW)] expected to be achieved per hour by the use of water injection per simple cycle CT and per SwiftPac proposed operation? What is the amount of profit in dollars expected to be achieved per hour and annually from the use of water injection per simple cycle CT and per SwiftPac proposed operation?
7. What are the costs for dry low-NOx combustors (DLNC) for natural gas firing for a simple cycle CT system?
8. In conducting its BACT evaluation for the Seminole Electric Cooperative's Payne Creek combustion turbine project (PSD-FL-344), the Department staff identified several simple cycle CT systems (some aero-derivative

machines) that, seemingly, would meet NO_x emissions much lower than the proposed 25 ppmvd @ 15% oxygen. Although not exhaustive, a list of these machines, the vendors of them, and internet links are included for your review, below. Please provide the following information: which, if any, of these manufacturers Tampa Electric Company (TECO) contacted regarding this project; which of these machines TECO evaluated for this project; if any of these machines were not evaluated for this project, the reasons for not considering them; why any of the machines that were evaluated were not chosen for this project; and why, if it is so, each of these machines fails to meet the Bayside Power Station's project specifications for the proposed pollutant emission limits. In reviewing TECO's response to these questions, it would be helpful, if possible, to have copies of the documents between TECO, its consultants and/or agents, and any equipment manufacturers related to or explaining the NO_x emissions capabilities and operating specifications of the equipment chosen or considered.

9. On the application page F.1. for a simple cycle CT system, a total percent efficiency control value for the pollutant NO_x is stated as 88%. What is the basis for the value and provide the calculations, assumptions and reference material to support this value?

10. In Table 5-4, the SCR catalyst life is stated as only 4 years. Since the turbines are only firing pipeline natural gas and no fuel oil, then it seems that the SCR catalyst's life would be more than the projected life stated in the cost evaluation. What type of SCR catalyst was selected for the cost evaluation in this project? How many catalysts are included in the pricing? Provide the vendor's specifications for the SCR catalyst system and include the vendor's guarantee for the SCR catalyst's life while firing only natural gas. Please note that there have been quotes that see the catalyst life expectancy of 15 years while firing natural gas only.

11. In Table 5-4, the electricity cost has a cost factor of 0.030 \$/kilowatt-hour and refers to a footnote that the factor is derived from a "recommended FDEP value". Provide the derivation of this factor.

12. In Table 5-5, under "Direct Capital Costs", provide a detailed breakdown of the individual equipment, a description of the equipment, and its cost that is included in the projected cost of \$16,104,000. If the initial catalyst cost is included in this total assessment, then its inclusion is not acceptable, based on the direction of EPA Region 4's letter to the Department of February 1, 2005, regarding the Seminole Electric Cooperative – Payne Creek project. Please adjust appropriately and resubmit, if necessary.

13. In Table 5-5, under "Equipment Costs", there is a footnote that states "includes exhaust duct modifications". Please explain what the footnote means and the detailed breakdown of the associated costs.

14. In Table 5-5, under "Installation Costs", provide a detailed description and cost breakdown of the individual listings under this header.

15. In Table 5-5, under "Indirect Installation Cost", you have listed a Process Contingency of 5%. Also, under Project Contingency, you have listed a value of 15%. In EPA's letter to the Department of February 1, 2005, regarding the Seminole Electric Cooperative – Payne Creek project, a comment was made that these values are not acceptable to use in the cost analysis, but suggested that only a value of 3% be used for the Process Contingency and 'zero' for the Project Contingency in the cost calculations. Please adjust your calculations appropriately and resubmit.

16. In Table 5-5, under "Preproduction Cost", provide a detailed description and breakdown of what is contained under this listing and the individual costs. If these costs are found in other evaluations, then it or they should be removed or adjusted appropriately and resubmitted, which is reflected in the U.S. EPA Region 4's letter to the Department of February 1, 2005, regarding the Seminole Electric Cooperative – Payne Creek project.

17. In Table 5-5, under "Energy Penalty (EP)", provide a detailed description and breakdown of how this cost value was calculated. Although it is appropriate to calculate the cost of the CT backpressure due to SCR, it should be based on the cost of the additional fuel combusted to replace the lost power and not the current price of electricity. If these costs are found in other evaluations, then it or they should be removed or adjusted appropriately and resubmitted, which is reflected in the U.S. EPA Region 4's letter to the Department of February 1, 2005, regarding the Seminole Electric Cooperative – Payne Creek project.

18. As stated in the U.S. EPA Region 4 letter to the Department of February 1, 2005, regarding the Seminole Electric Cooperative – Payne Creek project, a NO_x emissions rate of 25 ppmvd @ 15% oxygen using water injection does not represent BACT for a simple cycle CT system. This point is also reflected in a review of the U.S. EPA's RACT/BACT/LAER Clearinghouse (RBLC). Therefore, provide a top-down detailed equipment requirement and cost effectiveness analysis for a SCR system that would reduce the proposed BACT NO_x standard of 25 ppmvd @ 15% oxygen to 2.5 ppmvd @ 15% oxygen.

19. For carbon monoxide (CO), provide a detailed plan for monitoring the CO catalyst reactivity and how CO emissions will be affected.

20. Besides performing annual compliance stack testing using EPA Method 10, 40 CFR 60, Appendix A, provide a detailed plan to periodically monitor CO emissions through some catalyst testing and/or parametric monitoring to demonstrate on-going compliance with the resultant CO standards. A CO continuous emissions monitoring system (CEMS) was not proposed.

21. Regarding the application pages, provide the calculations that were used to project the potential and allowable emissions for each pollutant. For any capacity and emissions dependent of the heating value of the fuel, be sure to use the same heating value (HHV or LHV) throughout for consistency purposes. The maximum heat input capacity value used in the application is 336 MMBtu/hr (HHV) from the use of natural gas.

22. For all of the tables in the write-up and in Appendix B, provide the calculations, assumptions, and any reference material that was used to establish these tables.

23. Will there be an operational scenario where both combustion turbines in a pod (CT/pod) will be operating simultaneously? If yes, please explain.

24. How many SCR systems are included in the submitted design and cost effectiveness spread sheet? Please provide a plot plan of the design that would include the SCR systems.

25. Was the design for the SCR system to service only one CT or CT/pod at a time?

26. For the cost effectiveness spreadsheet, explain in detail the catalyst maintenance schedule. Is the catalyst design such that individual modules can be replaced versus the entire catalyst as maintenance dictates?

27. Please estimate the CO₂ impacts from this project.

28. For Table 5-7, provide the calculations, assumptions and reference material, to support the values listed under "Emission Impacts".

29. Why wasn't DLNC technology (TALON II low-NO_x combustors) proposed for this project? This technology has been used on Pratt-Whitney aero-derivative simple cycle CT units (FT8-2 type). What is the status of the Pratt-Whitney TALON II and TALON III low-NO_x combustor technology? Has the TALON III low-NO_x combustors been installed on any Pratt-Whitney aero-derivative simple cycle CT units? If so, where? Provide the identity of the application and the results of any testing to date.

30. Was the Pratt-Whitney FT8-2 turbine unit evaluated for this project since the unit can achieve up to 50 MW per TwinPac, which was one of the criteria used in the development of the project? If so, provide the analysis associated with evaluation. If not, explain why, since it appears to be the only FT8 unit equipped with DLNC, which is the dominant NOx control technology, besides SCR, associated with the latest BACT determinations.

31. Provide a pollutant netting table for the last five years from March 20, 2008, the date of the application.

32. For the proposed Black Start emergency generators (2), where are you going to store the fuel? Is there an existing storage tank on-site? If so, please describe.

33. On page 5-9, it is stated that "TEC has taken the opportunity to develop experience with a new generation technology, choosing P&W SwiftPac™ FT8-3 aero-derivative SCCTs in December 2007." Does this mean that TEC has already initiated and committed to a purchase contract for these simple cycle combustion turbines?

34. The following facilities were authorized to install new aero-derivative simple cycle combustion turbines through permitting. In these cases, SCR was imposed by BACT or proposed as the NOx control system that would allow the project to escape PSD new source review (NSR), which includes determinations of BACT or LAER.

- City of Tallahassee - Arvah B. Hopkins Generating Station: On October 26, 2004, the Department issued an air construction permit, No. 0730003-005-AC/PSD-FL-343, for the construction of two General Electric LM6000 Turbine-Generator sets, which are aero-derivative simple cycle combustion turbine-generator sets. The NOx limit is 5 ppmvd @ 15% oxygen for either natural gas-firing or fuel oil-firing. NOx emissions are controlled using water injection and SCR. A permit restriction of the NOx limit was requested in order to escape PSD NSR. Therefore, the installation of SCR is considered to be cost effective because it was used to avoid PSD NSR. This is the latest NOx BACT determination issued by the Department for aero-derivative simple cycle combustion turbines; and, compliance has been demonstrated. The RBLC has an ID of PSD-FL-343.
- New York City - Jamaica Bay Facility: A Pratt & Whitney FT8-3 TwinPac aero-derivative simple cycle CT set was permitted and the applicant requested a NOx limit of 2.5 ppmvd @ 15% oxygen for both natural gas and fuel oil; and, compliance has been demonstrated. NOx emissions are controlled using water injection and SCR. The proposed and permitted NOx limit were based on taking some fuel oil usage restriction in order to escape PSD NSR. Therefore, the installation of SCR is considered to be cost effective because it was used to avoid PSD NSR.
- CalPeak Power El Cajon LLC: On June 27, 2001, the San Diego County Air Pollution Control District issued an air construction permit, No. 976021, for the construction of a Pratt & Whitney FT8 DLNC TwinPac aero-derivative simple cycle CT set. The NOx BACT limit is 3.5 ppmvd @ 15% oxygen, 1-hour average, while firing only natural gas; and, compliance has been demonstrated. An SCR and oxidation catalyst were imposed by BACT for the additional control of NOx emissions. The RBLC has an ID of CA-1151.

Why did you not submit an application for emissions units that could meet, at a minimum, similar control criteria and standards?

35. Explain how you plan to demonstrate compliance with the NOx emissions standard using the emissions monitoring provisions of 40 CFR Part 75. Provide a detailed plan regarding this issue.

36. Comments were received from both the Hillsborough County Environmental Protection Commission and the U.S. EPA Region 4. These comments are attached and must be addressed as part of this incompleteness letter.

Tampa Electric Company
H. L. Culbreath Bayside Power Station
Project No. 0570040-024-AC/PSD-FL-399
Page 5

Example list of vendors and machines:

GE LM6000 and 15 ppm combustor:
http://www.gepower.com/about/press/en/2004_press/052504m.htm

GE 10-2 15 ppm:
http://www.gepower.com/about/press/en/2005_press/020105.htm

GE MS6001C 15 ppm:
http://www.gepower.com/prod_serv/products/gas_turbines_cc/en/midrange/ms6001c.htm

GE MS6001B, MS7001EA, MS7001FA:
http://www.gepower.com/prod_serv/products/tech_docs/en/downloads/ger3568g.pdf

Siemens SGT 300:
<http://www.powergeneration.siemens.com/en/oilgas/drives/gt/sgt300/technicaldata/index.cfm?session=518919x54914902>

Siemens SGT 400:
<http://www.powergeneration.siemens.com/en/oilgas/drives/gt/sgt400/technicaldata/index.cfm>

Siemens SGT 700:
<http://www.powergeneration.siemens.com/en/oilgas/drives/gt/sgt700/emissiontech/index.cfm>

Siemens SGT-800:
<http://www.powergeneration.siemens.com/en/oilgas/drives/gt/sgt800/emissiontech/index.cfm>

The Department will resume processing this application after receipt of the requested information. If you have any questions regarding this matter, please call Bruce Mitchell at (850)413-9198 or Cleve Holladay at (850)921-8986.

Sincerely,


Jonathan Holtom, P.E.
New Source Review Section
Bureau of Air Regulation

JH/bm

Attachments

cc: Mr. David M. Lukcic, Tampa Electric Company (dmlukcic@tecoenergy.com)
Mr. Thomas W. Davis, P.E., Environmental Consulting & Technology, Inc. (tdavis@ectinc.com)
Mr. Jerry Campbell, Hillsborough County Environmental Protection Commission (campbell@epchc.org)
Ms. Kathleen Forney, U.S. EPA, Region 4 (forney.kathleen@epamail.epa.gov)
Mr. Jim Little, U.S. EPA, Region 4 (little.james@epamail.epa.gov)
Mr. Dee Morse, National Park Service (Dee_Morse@nps.gov)

Harvey, Mary

From: Harvey, Mary
Sent: Friday, April 18, 2008 4:30 PM
To: 'Mr. David M. Lukcic, Tampa Electric Company'; 'Mr. Thomas W. Davis, P.E., Environmental Consulting & Technology, Inc.'; 'Mr. Jerry Campbell, Hillsborough County Environmental Protection Commission'; 'Ms. Kathleen Forney, U.S. EPA, Region 4'; 'Mr. Jim Little, U.S. EPA, Region 4'; 'Mr. Dee Morse, National Park Service'
Cc: Mitchell, Bruce; Holtom, Jonathan; Walker, Elizabeth (AIR); Gibson, Victoria
Subject: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399
Attachments: Document - Project #0570040-024-AC.pdf

Tracking:	Recipient	Delivery
	'Mr. David M. Lukcic, Tampa Electric Company'	
	'Mr. Thomas W. Davis, P.E., Environmental Consulting & Technology, Inc.'	
	'Mr. Jerry Campbell, Hillsborough County Environmental Protection Commission'	
	'Ms. Kathleen Forney, U.S. EPA, Region 4'	
	'Mr. Jim Little, U.S. EPA, Region 4'	
	'Mr. Dee Morse, National Park Service'	
	Mitchell, Bruce	Delivered: 4/18/2008 4:30 PM
	Holtom, Jonathan	Delivered: 4/18/2008 4:30 PM
	Walker, Elizabeth (AIR)	Delivered: 4/18/2008 4:30 PM
	Gibson, Victoria	Delivered: 4/18/2008 4:30 PM

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Thank you,

DEP, Bureau of Air Regulation

4/18/2008

Harvey, Mary

From: David Lukcic [dmlukcic@tecoenergy.com]
Sent: Monday, April 21, 2008 3:19 PM
To: Harvey, Mary
Subject: Re: Tampa Electric Company - Project#0570040-024-AC/PSD-FL-399

Thank you.

>>> "Harvey, Mary" <Mary.Harvey@dep.state.fl.us> 04/18/2008 4:29 PM >>>

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The Department of Environmental Protection values your feedback as a customer. DEP Secretary Michael W. Sole is committed to continuously assessing and improving the level and quality of services provided to you. Please take a few minutes to comment on the quality of service you received. Simply click on [this link](#) to the DEP Customer Survey. Thank you in advance for completing the survey.

Harvey, Mary

From: Tom Davis [tdavis@ectinc.com]
Sent: Friday, April 18, 2008 6:05 PM
To: Harvey, Mary
Subject: RE: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

From: Harvey, Mary [mailto:Mary.Harvey@dep.state.fl.us]
Sent: Friday, April 18, 2008 4:30 PM
To: Mr. David M. Lukcic, Tampa Electric Company; Mr. Thomas W. Davis, P.E., Environmental Consulting & Technology, Inc.; Mr. Jerry Campbell, Hillsborough County Environmental Protection Commission; Ms. Kathleen Forney, U.S. EPA, Region 4; Mr. Jim Little, U.S. EPA, Region 4; Mr. Dee Morse, National Park Service
Cc: Mitchell, Bruce; Holtom, Jonathan; Walker, Elizabeth \ (AIR\); Gibson, Victoria
Subject: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

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Harvey, Mary

From: Dee_Morse@nps.gov
Sent: Friday, April 18, 2008 5:21 PM
To: Harvey, Mary
Subject: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

Return Receipt

Your Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399
document:

was Dee Morse/DENVER/NPS
received
by:

at: 04/18/2008 03:20:17 PM

Harvey, Mary

From: Campbell, Jerry [Campbell@epchc.org]
To: Harvey, Mary
Sent: Monday, April 21, 2008 9:59 AM
Subject: Read: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

Your message

To: Campbell@epchc.org
Subject:

was read on 4/21/2008 9:59 AM.

Harvey, Mary

From: Little.James@epamail.epa.gov
Sent: Monday, April 21, 2008 9:04 AM
To: Harvey, Mary
Subject: Re: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

Please remove my name and e-mail address from your distribution list. I am retiring next week.

James W. (Jim) Little
U.S. Environmental Protection Agency, Region 4 Air, Pesticides, and Toxics Management Division
61 Forsyth St., SW
Atlanta, GA 30303-8960
Phone: (404) 562-9118
Fax: (404) 562-9019
E-mail: little.james@epa.gov

"Harvey, Mary"
<Mary.Harvey@dep.state.fl.us>

04/18/2008 04:29 PM

To

"Mr. David M. Lukcic, Tampa Electric Company" <dmlukcic@tecoenergy.com>, "Mr. Thomas W. Davis, P.E., Environmental Consulting & Technology, Inc." <tdavis@ectinc.com>, "Mr. Jerry Campbell, Hillsborough County Environmental Protection Commission" <campbell@epchc.org>, Kathleen Forney/R4/USEPA/US@EPA, James Little/R4/USEPA/US@EPA, "Mr. Dee Morse, National Park Service" <Dee_Morse@nps.gov>

cc

"Mitchell, Bruce" <Bruce.Mitchell@dep.state.fl.us>, "Holtom, Jonathan" <Jonathan.Holtom@dep.state.fl.us>, "Walker, Elizabeth \ (AIR\)" <Elizabeth.Walker@dep.state.fl.us>, "Gibson, Victoria" <Victoria.Gibson@dep.state.fl.us>

Subject

Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

Dear Sir/Madam:

Harvey, Mary

From: Mitchell, Bruce
Sent: Friday, April 18, 2008 4:33 PM
To: Harvey, Mary
Subject: RE: Tampa Electric Company - Project #0570040-024-AC/PSD-FL-399

4/18/08

Dear Mary,

Many many thanks for handling the processing of the project's documents on such short notice. You're very special! Take care and have a great week-end.

Bruce

From: Harvey, Mary
Sent: Friday, April 18, 2008 4:30 PM
To: 'Mr. David M. Lukcic, Tampa Electric Company'; 'Mr. Thomas W. Davis, P.E., Environmental Consulting & Technology, Inc.'; 'Mr. Jerry Campbell, Hillsborough County Environmental Protection Commission'; 'Ms. Kathleen Forney, U.S. EPA, Region 4'; 'Mr. Jim Little, U.S. EPA, Region 4'; 'Mr. Dee Morse, National Park Service'
Cc: Mitchell, Bruce; Holtom, Jonathan; Walker, Elizabeth (AIR); Gibson, Victoria
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4/18/2008