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Secretary

May 24, 2007

Mr. Gordon E. Clark
P.O. Box 165
Clayton, Georgia 30525

Re: Air Permit No. 0170004-016-AC (PSD-FL-383)
Progress Energy Florida, Crystal River Power Plant
Pollution Controls Project

Dear Mr. Clark:

We received your letter dated April 14th, which provided comments on the above referenced project. Attached is our Final Determination. We also forwarded your comments to our Southwest District Office, which is responsible for investigating complaints, and asked them to contact you. If you have any additional questions, please contact me at 850/488-0114.

Sincerely,

Jeffery F. Koerner

Jeffery F. Koerner
Bureau of Air Regulation
Air Permitting North

PERMITTEE

Progress Energy Florida Inc.
299 First Avenue North, CN-77
St. Petersburg, Florida 33701

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation, Air Permitting North Program
2600 Blair Stone Road, MS #5505
Tallahassee, Florida, 32399-2400

PROJECT

Air Permit No. 0170004-016-AC (PSD-FL-383)
Crystal River Power Plant, Pollution Controls Project

The existing Crystal River Power Plant is located in the Crystal River Energy Complex in Citrus County, north of Crystal River and west of U.S. Highway 19. To provide full flexibility in implementing the federal cap and trade program for nitrogen oxides (NO_X) and sulfur dioxide (SO_2) under the Clean Air Interstate Rule, the applicant proposes to install new burners, new selective catalytic reduction systems, new flue gas desulfurization (FGD) systems, and new stacks for the existing coal-fired Units 4 and 5. In conjunction with the proposed new control equipment, the applicant requests the flexibility to fire additional fuel blends (sub-bituminous coal and petroleum coke) and recognition of the true maximum heat input rates for Units 4 and 5. The applicant also proposes to install a new carbon burn-out system that will reburn fly ash generated at this plant to recover the remaining heating value in this material and minimize the onsite landfilling of fly ash. Finally, the applicant requests authorization for a trial period to evaluate a new fuel additive intended to reduce slagging and improve emissions performance.

NOTICE AND PUBLICATION

The Department distributed an Intent to Issue Permit package on March 19, 2007. The applicant published the Public Notice of Intent to Issue in the Citrus County Chronicle on April 11, 2007. The Department received the proof of publication on April 17, 2007. The Department granted an extension of time to file a petition for an administrative hearing on April 17, 2007. The extension expired on May 16, 2007.

COMMENTS

No comments on the Draft Permit were received from the EPA Region 4, the National Park Service or the Department's Southwest District Office.

Public

On April 23, 2007, we received a letter from Mr. Gordon E. Clark. Mr. Clark expressed an interest in the air permit project because he believes the plant is polluting the air around his house. Mr. Clark commented that there are small black particles in the air and on the exterior vinyl siding of his house. As described above, the primary purpose of the project is to install air pollution control equipment. The comments are acknowledged and the letter was referred to the Department's Southwest District Office on April 25, 2007 for follow up. The District office has contacted Mr. Clark and plans to meet the week of May 21st.

Permittee

The permittee, Progress Energy Florida (PEF), submitted the following comments after which the Department's response is provided. Unless otherwise specified, the referenced permit conditions are in Subsection A of the draft permit.

1. PEF has recently relocated their corporate offices. The correct address is: Progress Energy, Florida Inc., 299 First Avenue North, CN-77, St. Petersburg, Florida 33701.

   Response: The address was updated.

2. In the existing facility description on page 2, it should be clarified that there are two sets of mechanical draft cooling towers: one set of "helper" cooling towers and a second set of "modular" cooling towers.

Response: The existing facility description was updated.

3. In the existing facility description on page 2, it should be clarified that the nuclear unit and associated facilities are permitted under the *same* Title V permit as the coal units.

   Response: The existing facility description was updated.

4. In Condition 1a, clarify that Permit No. 0170004-013-AC for the SCR system is only "void and replaced by this permit" once Permit No. 0170004-016-AC is issued final.

   Response: The concern is acknowledged, but no change is necessary. The terms and conditions of an air construction permit are not effective until issued as a final action.

5. In Condition 2, add a qualifying statement indicating that "the information in this section is based on the preliminary design and the final design may change."

   Response: The following statement was added after the description of the proposed work, "The above information is based on the preliminary design. As necessary, the permittee shall provide the Permitting and Compliance Authorities with updated information should the final design significantly change."

6. In Condition 2c, remove limestone injection feed rate, the percent solids and specific gravity, as these are *preliminary* design estimates. Further, as monitoring of these parameters is not necessary to demonstrate compliance (i.e., the SO_2 CEMS will be used), PEF does not believe it is appropriate to have these design values listed as permit conditions.

   Response: As previously mentioned, the condition was revised to clarify that the information is based on the preliminary design. The Department agrees that compliance with the SO_2 standard will be demonstrated based on CEMS data. However, the parametric data provides additional insight on overall operation of the control equipment and can serve to verify effective control measures should the CEMS be unavailable. No additional change was made.

7. In Condition 2d, revise the last sentence to indicate that, if COMS are to be installed (comments on this issue to follow), the system will be installed in the ductwork prior to the FGD, not on the stack.

   Response: Condition 2d identifies the new stack configuration. Due to the wet stack conditions caused by the FGD system, moisture interference precludes installation of the COMS on the new stack. Therefore, COMS were removed from this condition. The issue is discussed further in Comments #13 and #15.

8. In Condition 3a, the SAM reduction of 85% is identified as a *design* figure. PEF requests that this be removed, as compliance will be determined by meeting the specified emission limit for SAM, not by determination of a required percent reduction.

   Response: The condition was clarified to state, "The preliminary design is for an 85% SAM reduction."

9. In Condition 3b, PEF requests removal of the reference to the ESP post-modification collection efficiency of 99.9%; it is inconsistent with PEF's most recent response to the Department's request for additional information. In addition, the level of detail describing the precipitator work scope is far too specific given detailed engineering has not commenced and changes are inevitable as the entire flue gas control system is optimized to meet permit limits. The permit can and should state the work is expected to improve ESP performance. Further, PEF commits that the total flue gas control system will allow the units to meet the particulate permit limit at the stack. PEF's proposed language revision is included in Attachment 1 to this letter.

   Response: PEF originally provided information that the ESP improvements would increase the calculated collection efficiency to approximately 99.91%. Subsequent information indicated the control efficiency would be 99.54% based on an uncontrolled rate of 6.52 lb/MMBtu and a controlled rate of 0.030 lb/MMBtu. Identifying the proposed work and control efficiency was not intended to be a requirement, but to be descriptive and reflect the capabilities of the ESP. Therefore, the first two sentences of this condition were revised to, "The permittee is <u>authorized</u> ~~required~~ to modify the existing ESPs to achieve the new PM/PM_{10} emissions standards<u>. Some of this work may include the following</u>~~. The primary work includes~~: ..." The last sentence was revised to, "*<u>{Permitting Note:</u> The modifications ~~will~~ <u>are intended to</u> improve the <u>estimated</u> collection efficiency to more than 99.<u>5</u>9%.*"

10. In Condition 5a, PEF requests an *annual* averaging time, rather than a 30-day rolling average, for the 6,800 MMBtu/hour heat input limit. PEF based the air quality modeling and other impacts analyses on the worst-case heat input rating of 7,200 MMBtu/hour. If the Department is going to propose a lower heat input limit, such as 6,800 MMBtu/hour, there is no justification for an averaging time more stringent than an annual basis.

    Response: As part of the application, PEF requested that permit identify the true maximum heat input rate so that the current Title V permitting note could be properly revised. In support of the request, PEF provided actual data showing the maximum 1-hour and 24-hour heat input rates for Units 4 and 5. The data showed individual 1-hour averages just above 7200 MMBtu/hour. To provide an operational margin, the requested maximum 7200 MMBtu/hour heat input rate was established as a 24-hour average. In a similar manner, the data showed the individual maximum 24-hour averages just above the requested secondary maximum heat input rate of 6800 MMBtu/hour with the worst case being less than 4% higher. To provide a reasonable operational margin, the requested maximum 6800 MMBtu/hour heat input rate was established as a 30-day rolling average, which is the longest averaging period that stills reflects equipment capacity and capabilities. No change was made.

11. In Condition 8b, PEF requests that the PM/PM_{10} emission rate be specified as 0.03 lb/MMBtu, rather than 0.03<u>0</u> lb/MMBtu.

    Response: The PM/PM_{10} standard is a BACT limit and the number of significant digits was intentional. No change was made.

12. In Condition 8c, PEF believes that, based on project-specific issues, the requested SAM limit of 0.012 lb/MMBtu is still appropriate and representative of BACT. There are very few retrofit boiler control systems documented in the EPA BACT/LAER Clearinghouse, and none were identified which deal with a BACT SAM limit for existing units utilizing an alkali injection system. However, PEF was able to identify a Constellation facility, referred to as the Brandon Shores Generating Station, which recently applied for an air construction permit for a retrofit project similar in many respects to the Crystal River project. The circumstances of Brandon Shores had also required a BACT determination for SAM emissions. PEF had provided this as additional information to the Department in an earlier response; however, the State of Maryland had not yet issued a permit with respect to the applicant's proposed SAM limit. Maryland has since issued its "Recommended Licensing Conditions" (PSC Case No. 9075) that grants the applicant's proposed SAM limit of 0.027 lb/MMBtu.

    Therefore, PEF continues to believe that the SAM value of 0.012 lb/MMBtu, proposed for Crystal River, is appropriate for an existing boiler that is retrofitted with SCR and FGD controls. While not as stringent as the Department's proposed limit, it is much more stringent than the recent recommended limit for Brandon Shores. The Department's proposed SAM limit of 0.009 lb/MMBtu is unnecessarily stringent and leaves little, if any, compliance margin. Finally, in spite of the Department's contentions in the Technical Evaluation document, SAM control vendors contacted by PEF have not been willing to guarantee an overall control efficiency, given the uncertainties of the effects of other components in the exhaust gas stream on the overall SAM reduction.

    Response: EPA's RACT/BACT/LAER Clearinghouse does not provide an adequate list of units retrofit with SAM controls because many of these projects avoid PSD after applying controls. SAM emissions from Units 4 and 5 at this plant may increase substantially due to PEF's request to fire coal with much higher sulfur content. In the application, estimates of SAM emissions were very conservative at each step throughout the system resulting in a high final emissions rate. The BACT determination is based on information provided in support of the application as well as that available for the proposed control systems. No change was made.

13. In Condition 9c, there should be no imposition of an opacity standard during "startup, shutdown and malfunction" periods, as this is impractical to achieve and is inconsistent with current NSPS regulations (Subpart D which exempts startup, shutdown and malfunction through 40 CFR 60.11(c), the General Provisions in Subpart A). Initial discussions with the Department on this issue indicated an acknowledgement that this condition will be corrected in the final permit.

    Response: NSPS Subparts Da and Db each establish an opacity standard of 20%, except for one 6-minute period per hour of not more than 27%. However, Subpart Db also specifically states, "The particulate matter and opacity standards apply at all times, *except during periods of startup, shutdown or malfunction*." This statement is not included in Subpart Da, so the alternate opacity standard for startup, shutdown and malfunction was erroneously based on the NSPS Subpart Da standard. As mentioned by PEF, the following statement is included in the NSPS General Provisions of 40 CFR 60.11(c), "The opacity standards set forth in this part shall apply at all times *except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard*." This error was corrected by removing the alternate standard.

    In addition, with respect to the opacity standard, PEF believes that the Department went beyond its authority in lowering the normal operations opacity standard to 10%. Although this may have been consistent with estimates provided to the agency related to the ESP upgrade project, as stated above, more recent information submitted to the Department does not support lowering the standard below the current 20% opacity limit. This standard is far in excess of the NSPS for coal fired boilers and beyond BACT determinations for any existing, as well as most new coal fired boilers.

Response: The opacity standard is intended to reflect BACT and not the BACT floor, which is the NSPS. It was based on the information in PEF's request for bid requested by the Department.

PEF Comment: If the 10% opacity requirement remains as BACT, it should be clearly stated that annual compliance testing (via EPA Method 9) is the only required compliance verification and that the 10% BACT standard does not affect existing NSPS Subpart D requirements related to opacity monitoring and excess emissions and CMS reporting. As compliance would be determined by EPA Method 9, the opacity standard should be moved from Condition 9 ("Standards Based on CEMS/COMS") and placed in a separate condition. That condition should clarify that EPA Method 9 is the compliance method and that "at the option of the applicant" COMS data may be used in lieu of EPA Method 9. Proposed wording is as follows:

> "*Opacity:* Demonstrate compliance with the opacity limit by using visible emissions readings conducted in accordance with EPA Method 9. These readings must be taken annually by a certified observer, for at least one hour in duration during normal source operation. These EPA Method 9 readings will occur only during months when the source operates at normal conditions for at least 24 consecutive hours and weather/lighting conditions are conducive to taking proper EPA Method 9 readings. This requirement will become effective upon installation of the FGD system".

While it may be necessary to install COMs in each unit's ductwork for NSPS purposes, PEF cautions that the data generated should not be relied on for compliance purposes. There are several reasons for this. When a new FGD is installed, the opacity monitor moves from dry stack to FGD inlet duct(s). PS-1 requires four duct diameters downstream and two duct diameters upstream of disturbance. Six duct diameters of straight duct may not be possible, due to space limitations, and an alternate, less representative location may be necessary. This may introduce additional error into the opacity measurements. Further, FGD units with multiple ESP outlet ducts require an opacity monitor and flow signal on each duct. The current duct configuration may require multiple opacity monitors on each unit. Calculating an equivalent stack exit opacity value from several duct opacity monitors requires a complex formula using optical density, flow, and path length. Finally, keeping opacity monitors aligned on ducts is much more difficult than on stacks.

Response: As previously acknowledged, COMS will not be required on the new stack due to wet flue gas conditions caused by the FGD system. Although COMS will be installed in the ductwork just after the ESP, this is not necessarily indicative of the final stack opacity because the measurement will be taken before any additional control by the wet scrubber system. Therefore, Condition 9c was deleted as a COMS requirement and the remainder of this condition renumbered. Under "Standards Based on Stack Tests", the following requirement was added as Condition 8e, "As determined by EPA Method 9, the stack opacity shall not exceed 10% based on a 6-minute block average, except for one 6-minute period per hour of not more than 20%." This change was also made in Appendix E, which summarizes the final BACT determinations.

14. In Condition 9e (renumbered as 9d in final permit), revise the language as follows: "Within ~~15~~ 24 months of commencing commercial operation of each unit with the new low-NOx burners, the permittee shall submit an application proposing a revised ~~(lower)~~ final BACT standard." If normal operation indicates that a higher permit limit is appropriate, PEF would like the ability to adjust the permit limit as appropriate.

    Response: Due to the extensive work involved in this project and the capability of firing different fuel blends, the condition was revised as follows, "Within ~~15~~ 24 months of commencing commercial operation of each unit with the new low-NO_X burners, the permittee shall submit an application proposing a revised (lower) final BACT standard. The final standard shall be based on actual CO emissions data collected for ~~the~~ initial ~~12 months of~~ operation after completing installation of the new low-NO_X burners. There may be separate standards proposed for different fuels." The word "lower" was not deleted because the purpose of the condition is to allow sufficient time for operators to shakedown the equipment and establish good operating practices expected to lower the actual emissions rate.

15. The reference in Condition 13 to opacity monitoring should be revised to indicate that COMS will be installed in the ductwork prior to the FGD and not on the stack. The language should state that "the monitors will be installed, operated and maintained in accordance with the existing requirements of 40 CFR 60.45, as well as the provisions of the federal acid rain program."

    Response: The condition was clarified as follows, "For Units 4 and 5, the permittee shall continue to calibrate, operate, and maintain continuous monitoring equipment to measure and record opacity, NO_X and SO_2 in terms of the applicable standards. The permittee shall either relocate the existing ~~COMS and~~ CEMS to ~~on~~ the new stack configurations or replace the monitoring systems. Due to the wet stack, the existing COMS shall be relocated or new COMS installed in the ductwork after the ESP and prior to the wet FGD system. Each COMS and CEMS shall be installed such that representative measurements of emissions or process parameters from the facility are obtained. The monitors shall be installed, operated and maintained in accordance with the existing requirements of 40 CFR 60.45, as well as the provisions of the federal acid rain program."

16. Condition 15 references Appendix F of the permit, which is intended to address only CEMS and not COMS. Appendix F should be updated to the current version of "Appendix CEMS" (February 15, 2007). Finally, as discussed earlier, while excess emissions are measured by a continuous monitoring system under the applicable NSPS, the COMS would not be required for compliance with the opacity BACT limit which will be measured at the stack. Opacity should be removed from this condition.

    Response: The only requirement for COMS in Appendix F is to continue to meet the applicable performance specifications and quality assurance procedures for the existing COMS. Condition 13 of the permit already requires that the monitors be installed, operated and maintained in accordance with the existing requirements of 40 CFR 60.45. Therefore, the references to COMS were removed from Appendix F.

17. In Condition 19a, remove the last sentence, as PEF would like to reserve the ability to retest the unit at 90% to 100% of the 7200 MMBtu/hr heat input rate to regain any lost capacity.

    Response: Once construction is complete, the permit requires the initial tests to be conducted at permitted capacity, which is defined in Rule 62-297.310(2), F.A.C. as 90% to 100% of the maximum operation rate allowed by the permit. Should initial problems prevent operation at full load, the permit does not preclude retesting at permitted capacity to show compliance. The condition reserves the right of the Department to revise the permitted capacity if a unit is unable to achieve the rated maximum operating rate with the installed equipment. A permitting note was added and the last sentence of this condition was revised to, "All initial tests shall be conducted with the emissions units operating at ~~90% to 100% of the~~ permitted capacity ~~specified by this permit~~ (within at least 90% of 7200 MMBtu/hour ~~based on a 24-hour average~~); otherwise, this permit shall be modified to reflect the true maximum capacity of each unit as constructed should the permitted capacity be unattainable. If initial equipment problems prevent operation at permitted capacity, the initial tests may be repeated to demonstrate compliance at permitted capacity."

18. Remove Condition 19c, which requires testing at the highest expected sulfur level and retesting if the actual sulfur content of the coal blend increases by 0.5% by weight or more. This requirement is very burdensome. It is difficult to purchase coal with specific levels of sulfur content. Annual test requirements should account for the variability of the sulfur level in the various coals combusted.

    Response: PM and SAM emissions are dependent on the fuel sulfur content and compliance is demonstrated by stack test. Therefore, it is important to ensure compliance is demonstrated under the high sulfur conditions. The condition simply requires new PM and SAM compliance testing if the fuel sulfur levels jump by 0.5% by weight or more. Once compliance is demonstrated for the highest sulfur levels (2.63% to 3.13% sulfur by weight), subsequent tests shall be conducted with the highest sulfur content representative of the actual coal blends being fired. The following clarifications were made:

    > "Initial ~~C~~compliance tests shall be conducted with the highest sulfur content representative of the actual coal blends ~~that will be~~ being fired. ~~If~~ Within 60 days of determining that the fuel sulfur content of the actual coal blends fired have increased by 0.5% by weight or more from the ~~last~~ highest tested sulfur content that demonstrated compliance ~~test~~, the permittee shall conduct new tests to determine emissions of opacity, PM and SAM. For purposes of this condition, the fuel sulfur content shall be based on an average of the as-fired fuel samples for 30 successive operating days. Once initial compliance has been demonstrated at the higher fuel sulfur levels (2.63% to 3.13% sulfur by weight), subsequent tests shall be conducted using a fuel with a sulfur content that is representative of the actual coal blends being fired."

19. On page 11, Condition 19d, PEF requests removal of the phrase "Except for the initial tests", as PEF would like to reserve the ability to retest the unit at 90 to 100 percent of the 7,200 MMBtu/hr heat input rate to regain any lost capacity.

    Response: Once the initial tests are satisfied, Condition 19d allows the following, "... an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity." See Comment 18 for the changes regarding initial testing. No additional changes were made.

20. In Condition 21, the last sentence is incomplete.

    Response: This sentence was revised to, "The stack test report shall also ~~report~~ indicate all required operational data collected during each test run."

21. In Condition 23, please remove "and the higher heating value (HHV)". HHV vs. LHV is typically not defined in coal analyses. Also, as mentioned in Comment 10, PEF requests a revision of the 30-day rolling average to an annual average.

    Response: Although slight, there is a measurable difference between HHV and LHV for coal. PEF provided additional information indicating that the maximum heat input rates were based on HHV. No change was necessary.

22. In Condition 24, remove "higher heating value HHV" and replace with "the heating value of the ash". There should not be any hydrogen in the ash to distinguish between HHV and LHV.

    Response: For ash, there is a negligible difference between HHV and LHV. The condition was revised as requested.

23. On page 12, Condition 25, please remove the ammonia injection rate in "a", the limestone slurry injection rate in "b", and precipitator monitoring in "d". Emission limits for the respective pollutants will be monitored with the CEMs system and the opacity monitoring requirement. With respect to the monitoring of ESP current and voltage, PEF had previously conducted an analysis of these parameters for suitability of use in a CAM plan for PM compliance and found there to be little correlation. The Utility Air Regulatory Group (UARG) has submitted similar comments to the EPA regarding their proposed amendments to the NSPS, Subpart Da.

    Response: For the installed control systems, PEF will need to monitor and record the SCR ammonia injection rate and the limestone slurry injection rate to adjust these parameters for proper operation. No change was made to these parameters. PEF provided additional information regarding the ESP power input. Based on the number of fields and the low correlation, this requirement was revised as follows, "The permittee shall continuously monitor and record the opacity in the ductwork just after the ESP for use as part of the Compliance Assurance Monitoring Plan under Title V. ~~current and voltage to determine the secondary power input to the ESP. Data shall be reduced to 1-hour and 3-hour block averages.~~ Operation of the ESP shall be based upon COMS data collected ~~performance~~ during satisfactory PM emissions compliance tests." These changes were also made in Condition 20 and Appendix E (a summary of the final BACT determinations).

24. In Subsection B for the material handling operations, PEF requests several revisions to the Process Description section that is prior to the permit conditions. In addition to some corrections, the changes are intended to provide acceptable process descriptions in more general terms and eliminate specific terms such as "conveyors G1A" because the final design has not yet been completed. In Condition 2, PEF requests that the dust control technique for the wet ball mill grinder be changed from "enclosure/wet" to "wet".

    Response: The requested changes to the Process Description were made except for identifying some of the operating parameters, which were noted as being based on the "preliminary design". The requested change to Condition 2 was made as the material will be very wet at this point. This change was also made in Appendix E, which summarizes the final BACT determinations.

25. In Subsection E, the test burn should be designated for Units 1 and 2, as well as Units 4 and 5. Also, the sentence in Condition E.1 should be revised as follows: "The preliminary design is to spray the fuel additive on the coal prior to combustion ~~in the gravimetric feeders~~."

    Response: The clarifications and changes were made. Units 1 and 2 were added as affected units to Section 1 of the permit.

26. In Subsection B, remove the word "ash" form the material handling provisions for limestone and gypsum in Conditions 11 and 12.

    Response: The corrections were made.

CONCLUSION

The final action of the Department is to issue the permit with the minor revisions, corrections, and clarifications as described above.