4APT-APB

Mr. A. A. Linero, P.E.
Florida Department of Environmental Protection
Mail Station 5500
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Linero:

Thank you for sending the preliminary determination and draft prevention of significant deterioration (PSD) permit for El Paso Merchant Energy's Belle Glade Energy Center (PSD-FL-317) dated September 7, 2001. The preliminary determination is for the proposed construction of two simple cycle combustion turbines (CTs) and one combined cycle combustion turbine with a total nominal generating capacity of 600 MW to be located in Palm Beach County, Florida. The combustion turbines proposed for the facility are General Electric, frame 7 FA units. As proposed, each simple cycle CT will be allowed to fire natural gas an average of 5,000 hours per year and the combined cycle CT will be allowed to fire natural gas up to 8,760 hours per year. Total net emissions increases from the proposed project are above the thresholds requiring PSD review for nitrogen oxides (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM/PM_{10}), and sulfuric acid mist.

Based on our review of the PSD permit application, preliminary determination and draft PSD permit, we have the following comments:

1. The permit application package includes a draft permit with appendices including Appendix BD, the best available control technology (BACT) determination. We understand that the draft permit takes precedence over Appendix BD and that any items in Appendix BD that appear to be a requirement must be incorporated in the permit to be enforceable. This understanding lies at the base of some of the comments below.

2. We understood the reason for El Paso proposing to configure only one of the combustion turbines as part of a combined cycle system (that is, to avoid the requirements of Florida's Power Plant Siting Act). But at the same time, we were concerned that El Paso might sequentially convert the simple cycle combustion turbines to combined cycle operation without going through the same level of control technology assessment that would have been required had combined cycle operation been proposed from the start. Therefore, we were pleased to see the permit condition requiring a revised CO and NO_x BACT analysis should El Paso

propose to convert a simple cycle combustion turbine to combined cycle service and further requiring that this analysis be performed as though the turbine had never been built (thus precluding any "equity in the ground" advantage).

3. The 2.5 ppmvd NO_x emission limit determined to represent BACT for the combined cycle combustion turbine is equal to the lowest BACT emission rate that has been established in Region 4 to date and is similar to many of the lowest BACT emission rates that have been established in other regions as well. On the other hand, the 24-hour compliance averaging period associated with the 2.5 ppmvd limit (as well as the 9 ppmvd NO_x emission limit for the simple cycle combustion turbines) is longer than many of the combustion turbine NO_x compliance averaging periods for similar projects. (Compliance averaging periods of 1 to 3 hours appear in many permits.) However, we consider 24 hours to be an acceptable averaging period in light of the low emission limits.

4. Regarding the CO BACT determination and associated emissions limits, we have the following comments:

   a. The draft permit CO emission limit of 8 ppmvd for the simple cycle combustion turbines and for the combined cycle combustion turbine when not operating in power augmentation mode is among the lower BACT limits established in Region 4 for combustion turbines. We further understand Florida Department of Environmental Protection's (FDEP) expectation that the turbines will in fact typically operate with even lower emissions based on inherent combustor design and good combustion practices alone. However, please note that the use of catalytic oxidation for further control of combustion turbine CO emissions, especially for combined cycle combustion turbines, has become much more common as part of BACT determinations for combustion turbine projects. Catalytic oxidation has the added advantage of controlling volatile organic compound (VOC) emissions including volatile organic hazardous air pollutants.

   b. Further related to the CO draft permit emission limit of 8 ppmvd, we note that Appendix BD (the BACT determination) indicates an emission rate of 7.4 ppmvd at full load for either combined cycle or simple cycle combustion turbines. Based on our understanding that the draft permit has precedence over Appendix BD, we presume that 8 ppmvd will be the enforceable limit.

   c. Emissions of CO from combustion turbines increase sharply below a certain load level (unless an add-on control device is in use). For GE 7FA combustion turbines, this sharp increase occurs with operation below about a 50-percent load level. It is not clear to us that the draft permit restricts normal operation (that is, operation other than during startup and shutdown) to load levels of 50 percent and higher. Condition A.17.c. prohibits operation of the combined cycle combustion turbine at "DLN Modes 1, 2, 3, and 4"

(except during startup and shutdown), and Condition B.13.c. specifies a similar restriction for the simple cycle combustion turbines. Since the load levels equivalent to these modes are not specifically stated, however, we are not certain what load levels are prohibited. Furthermore, we would appreciate your identifying which monitoring requirements in the draft permit serve to track compliance with the low-load restrictions.

5. We have the following comments concerning the startup and shutdown provisions of the permit package:

   a. As we have often commented, startup and shutdown are part of normal combustion turbine operation and need to be addressed in PSD permits. FDEP has done so for this project by establishing a work practice standard and by limiting the number of hours of emissions that can be excluded from NO_x and CO compliance demonstrations for the combined cycle combustion turbine and from NO_x compliance demonstration for the simple cycle combustion turbines. Other permit options that could be considered include limitations on the number of startups and shutdowns in any 12-month period; mass emission limits for NO_x and CO emissions during any 24-hour period to include emissions during startup and shutdown; and future establishment of startup and shutdown BACT emission limits for NO_x and CO derived from test results during the first few months of commercial operation. In addition, compliance with any explicit or implicit annual emissions limits should be assessed with startup and shutdown emissions included. Regarding the option of mass emission limits, we acknowledge FDEP's comments that such limits may be difficult to quantify.

   b. The only definition of startup that we find is in Appendix BD of the package. As mentioned previously, we understand that the provisions of Appendix BD are not necessarily enforceable. Furthermore, the definition in Appendix BD denotes when startup commences but does not state the operating level or other characteristic marking the end of startup and the beginning of normal operation. We recommend that a more complete definition be developed so that the emission measurements eligible for exclusion under the excess emissions provisions can be confirmed easily.

   c. Conditions 17d of the combined cycle section and 13d of the simple cycle section contain provisions allowing certain data during periods of startup and shutdown to be excluded from compliance demonstrations.

      i. Condition 17d for the combined cycle combustion turbine exempts up to 2 hourly emission rate values in a calendar day, except for combined cycle cold startups, in which case up to 4 hourly emission rate values in a calendar day can be exempted. Additionally, Condition 17d indicates that no more than a total of 4 hourly emission rate values shall be exempted in a calendar day. It is unclear to us the purpose of the latter restriction on total hourly emission rate values. Also, it should be clarified in what case a total of 4 hours can be

exempted when there is no combined cycle cold startup during the calendar day.

ii. Condition 13d for the simple cycle combustion turbines exempts "no more than 2 hourly emission rate values" from the NO_x compliance demonstration as well as restricting the exemption to "no more than a total of 3 hourly emission rate values" in a calendar day. The purpose of the latter restriction is unclear, since the NO_x compliance period is a 24-hour block average. Finally, to remain consistent with previous FDEP simple cycle combustion turbine permits, no more than 2 hours out of a 24-hour period (or calendar day) should be exempted from compliance demonstrations.

6. Draft permit Condition 14 pertaining to simple cycle combustion turbines requires testing initially and at permit renewal for PM/PM_{10}, CO, NO_x, and VOC. The draft permit conditions for the combined cycle combustion turbine do not require PM/PM_{10} and VOC initial and renewal testing. We have agreed with FDEP in the past that PM/PM_{10} and VOC testing is not required for combined cycle combustion turbines with continuous emission monitoring systems (CEMS) for CO. However, a permit for a project with both combined cycle and simple cycle combustion turbines that has different initial and renewal testing requirements for the two types of turbines may be perceived as inconsistent. On a related point, we recommend that FDEP give consideration to requiring CO CEMS for the simple cycle combustion turbines as well as for the combined cycle combustion turbine in view of the fact that the simple cycle combustion turbines will be allowed to operate up 5,000 hours per year at full load (and even more hours at a combination of full and partial loads).

7. The term "pipeline-quality natural gas" appears several times in the draft permit. We have sought in the past for a government agency or industry trade group definition of "pipeline-quality" and have never succeeded in finding such a definition. We presume that the term "pipeline-quality natural gas" means natural gas obtained from an intrastate or interstate commercial natural gas pipeline.

8. The draft permit contains an emission limit for ammonia of 5 ppmvd. Ammonia is not regulated under the PSD program, and we do not have a definitive policy on ammonia emissions. However, we can comment that the limit in the draft permit is consistent with (although not equal to the lowest) ammonia limits we are aware of from projects outside Region 4.

9. In the air quality impact evaluations prepared for this project, we see no acknowledgment that NO_x emissions are precursors to ground-level ozone formation. Such acknowledgment would help demonstrate why control of NO_x emissions from combustion turbines is important.

Thank you for the opportunity to comment on the Belle Glade Energy Center preliminary determination and draft PSD permit. If you have any questions regarding these comments, please direct them to either Katy Forney at 404-562-9130 or Jim Little at 404-562-9118.

Sincerely,

Kay T. Prince
Chief
Air Planning Branch

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