

US EPA ARCHIVE DOCUMENT



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS TX 75202-2733

MAY 14 2013

Mr. John Packard
Manager of Generation
South Texas Electric Cooperative, Inc.
P.O. Box 119
Nursery, TX 77976

RE: Completeness Determination for South Texas Electric Cooperative, Inc.
Greenhouse Gas Prevention of Significant Deterioration (PSD) Permit Application
Red Gate Power Plant, Hidalgo County

Dear Mr. Packard,

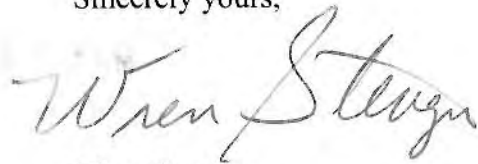
The EPA has reviewed your Greenhouse Gas (GHG) Prevention of Significant Deterioration (PSD) permit application for South Texas Electric Cooperative, Inc. that was received by the EPA on January 2, 2013, including supporting documentation, and determined that your application is incomplete at this time. A list of the information needed from you so that the EPA can continue its completeness review is enclosed (see Enclosure). Please notify us if a complete response is not possible by May 24, 2013.

The requested information is necessary for EPA to develop a Statement of Basis and Rationale for the terms and conditions for any proposed permit. As we develop our preliminary determination, it may be necessary for EPA to request additional clarifying or supporting information. If the supporting information substantially changes the original scope of the permit application, an amendment or new application may be required.

The EPA may not issue a final permit without determining that: 1) there will be no effects on threatened or endangered species or their designated critical habitat, or 2) until it has completed consultation under Section 7(a)(2) of the Endangered Species Act (16 USC § 1536). In addition, the EPA must undergo consultation pursuant to Section 106 of the National Historic Preservation Act (NHPA) (16 USC § 470f). As a reminder, NHPA implementing regulations require that EPA provide information to the public with an opportunity for participation in the Section 106 process. 36 CFR § 800.2(d). We look forward to receiving the Biological Assessment and Cultural Resources Reports that you have agreed to prepare for EPA for our use in complying with these statutes.

If you have any questions regarding the review of you permit application, please contact Melanie Magee of my staff at (214) 665-7161 or magee.melanie@epa.gov.

Sincerely yours,

A handwritten signature in cursive script that reads "Wren Stenger".

Wren Stenger

Director

Multimedia Planning and
Permitting Division

Enclosure

ENCLOSURE

EPA Information Request

South Texas Electric Cooperative (STEC), Inc

Red Gate Power Plant, Hidalgo County, Texas

Application for Greenhouse Gas Prevention of Significant Deterioration Permit

1. On page ES-1 of the permit application, it is stated that "STEC conducted a technology assessment to evaluate various power generation alternatives including simple-cycle combustion turbine, simple-cycle reciprocating engine, and combined-cycle combustion turbine based technologies....Of the technologies evaluated, reciprocating engines were selected as the best combination of efficiency, flexibility and cost. A simple-cycle reciprocating engine plant is composed of multiple smaller units whose dispatch can be optimized to maintain peak plant efficiency over a larger operating load range....This rapid start capability, combined with the small dispatchable unit size, minimizes part load operation and results in greater overall plant efficiency and reduced emissions." The emission reduction techniques proposed for this project are "energy efficient engine fired with natural gas, good combustion practices, and add-on control devices include selective catalytic reduction and oxidation catalysts." Please provide the technical assessments that were performed to evaluate power generation alternatives considered for this project. Please include the different operating scenarios evaluated, the different designs of turbines and engines, and different configuration of turbines and engines considered. Please include the reasons for elimination for each alternative evaluated and any data that evaluated the efficiencies of the turbines and engines, the amount of GHG emissions associated with each alternative and the GHG reduction levels. Provide technical data that supports the number of proposed reciprocal internal combustion engines (RICE) for this project and why this enhances energy efficiency versus the other options considered for this project. Please provide benchmark data that compares the plant energy efficiency of using 12 RICE to other power plants.
2. On page ES-2 of the permit application, it is stated that the proposed operating load range is roughly 40% to 100%. Please provide supplemental data that includes production output, gross heat rate and percent efficiency of engines being considered and please provide this data for similarly designed engines recently permitted by air permitting authorities nationwide or operating internationally (this information may be represented graphically in load/efficiency curves).
3. On page ES-2 of the permit application, it states the proposed add-on pollution control devices to be employed by the RICE will include selective catalytic reduction (SCR) and oxidation catalyst. This is also indicated on the process flow diagram. How will the operations of the add-on technologies affect the operation of the combustion engines and thereby affect the production of GHG emissions? Please supplement the application with detailed information on the SCR and oxidation catalyst pollution control technologies to be utilized and the affect on the operation of the RICE and the amount of GHG emissions that are produced.
4. Beginning on page 1-1 of the application, it states that Red Gate will consist of 12 spark ignition (SI) RICE. In order to meet the peaking requirements of the proposed plant, the SI RICE will be operated in simple-cycle mode. The four-stroke lean burn (4SLB) natural gas-fired engines being proposed are the Wartsila 18V50SG. Please provide manufacturer design specification data sheets and comparative benchmark efficiency and/or data for these RICE to existing or similar engines.

5. On page 1-2 of the application, it states that to limit the exposure of STEC member load to temporary price spikes, STEC is constructing Red Gate as a “peaking generation facility.” However, page 3-1, Table 3, footnote 1, states that annual emissions are based on 8,760 hours of operation for the SI RICE. The characteristics of a power generating plant that has been designed to operate as a peaking facility typically include fewer operating hours and more startups/shutdowns than a power plant that has been designed to operate as a base and/or intermediate load facility. As is stated in the proposed NSPS for EGU’s “the peaking season is generally considered to be less than 2,500 hours annually.” (77 FR 22432). Furthermore, 40 CFR 72.2 defines a “peaking unit” as having “an average capacity factor of no more than 10.0 percent during the previous three calendar years and a capacity factor of no more than 20.0 percent in each of those calendar years.” The proposed annual emission limits that are calculated based on 8,760 hours of operation for the SI RICE is substantially greater than 2500 hours annually, and also appears to be greater than either the 10 (average annual) or 20 percent (maximum annual) capacity factor in the federal definition of “peaking unit.” Accordingly, please provide supplemental details on expected load shift and duration of periods of reduced generation or no load that would negatively impact STEC from selecting combined cycle turbines and/or any data/plant metrics that supports the selection of simple cycle reciprocal engines in the BACT analysis. Please also provide a calculated annual load factor for the proposed reciprocal engines.
6. On page 3-1 of the permit application, it states that “There is effectively no cold start from a stand-by perspective, because during start-up electric heaters are used to circulate warm water until the engine block reaches a temperature sufficient to allow start-up, which is roughly 125°F.” Did you consider using a combined cycle unit that would provide the same effect without the additional power requirements? If so, why was this option eliminated?
7. STEC did not propose to implement a fugitive emission monitoring program for piping components. Please provide supplemental data to the 5-step BACT analysis for fugitives that include a comprehensive evaluation of the technologies considered to reduce fugitive emissions and a basis for elimination, or information detailing why fugitive emissions will not be emitted from this project. The technologies could include, but are not limited to, the following:
 - Installing leakless technology components to eliminate fugitive emission sources;
 - Implementing an alternative monitoring program using a remote sensing technology such as infrared camera monitoring;
 - Designing and constructing facilities with high quality components and materials of construction compatible with the process known as the Enhanced LDAR standards;
 - Monitoring of flanges for leaks;
 - Using a lower leak detection level for components; and
 - Implementing an audio/visual/olfactory (AVO) monitoring program for compounds.

The BACT analysis should include for the proposed monitoring program a compliance strategy. (i.e., frequencies of inspections, maintenance repair strategy, recordkeeping, etc.).

8. What are the proposed recordkeeping requirements for the combustion engines operating parameters? How will the air/fuel ratio be assured during operation of the combustion engines, i.e., alarms, alerts, continuous monitoring, etc? Will O2 or CO2 analyzers be utilized? What will

be the target ratio? Please provide more details of what operating parameters will be monitored to ensure equipment is operating at the design efficiency.

9. Please provide the supporting calculations for the proposed BACT output-based limit of 1193 lbCO₂/MWh and the basis to support the rationale used to derive the limit.
 10. BACT is a case-by-case determination. Please provide site-specific facility data to evaluate and eliminate carbon capture storage (CCS) from consideration. This material should contain detailed information on the quantity and concentration of CO₂ that is in the waste stream and the equipment for capture, storage and transportation. Please include cost of construction, operation and maintenance, cost per pound of CO₂ removed by the technologies evaluated and include the feasibility and cost analysis for storage or transportation for these options. Please discuss in detail any site specific safety or environmental impacts associated with such a removal system.
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