Blue Ridge Environmental Defense League

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Donald R. van der Vaart, Chief
Division of Air Quality, Permitting
1641 Mail Service Center
Raleigh, North Carolina 27699-1641

September 9, 2013

RE: Duke Energy Progress - Richmond County Turbines, Richmond County Energy Complex
Application ID: 7700070.11A, Permit No.: 08759T15

Dear Dr. Van der Vaart:

On behalf of the Blue Ridge Environmental Defense League, I write to provide comments on the Richmond County Turbines draft permit.

Recommendations

The Blue Ridge Environmental Defense League recommends that before this permit is issued the Division of Air Quality should:

1. Hold a permit hearing in the Hamlet, NC area. We have been in contact with residents in Hamlet, Rockingham and nearby communities. They are concerned and some have made requests for a public hearing directly to the Division.
2. Reject the permit as written and draft a site-wide permit.
3. Prevent six combustions sources to be separated from the existing permit.
4. Deny the request by Duke Energy Progress to side-step the North Carolina Clean Smokestacks Act at the Richmond County Turbine facility.

Background

At the Richmond County Energy Complex, Duke Energy Progress operates seven combustion turbines permitted to burn either fuel oil or natural gas, and three auxiliary boilers burning natural gas. Five of the turbines are simple cycle; two are combined cycle. All seven turbines use dry low NOx combustors and water injection for pollution control. The two combined cycle turbines add selective catalytic reduction. Presently, the electric output of the facility is 1600 MWe, and is classed standard industrial code SIC 4911. With the new permit, Duke Energy Progress seeks to increase its power by 36% to approximately 2000 MWe.

The draft permit adds two 190 MWe Siemens SGT6-5000F combustion turbine generators (ES-13 and ES-14), a new natural gas fired auxiliary boiler (ES-15), seeks to modify the existing natural gas fired auxiliary boiler (ES-10) and removes six units from the permit, although they still operate within the facility fence line.

General Comments

Combustion turbines are remarkable for their lack of efficiency in converting chemical energy to mechanical energy. Part of the output is lost the in compressor where intake air is compressed up to 30 atmospheres of pressure, before the fuel is burned. Accordingly, ñMore than 50 percent

of the shaft horsepower is needed to drive the internal compressor and the balance of recovered shaft horsepower is available to drive an external load.ò[1] The two types of turbines utilized at the Richmond County facility are simple-cycle and combined-cycle. The simple cycle has a thermal efficiency of only 15 to 42 percent. Combined cycle units add a *heat recovery steam generator* to boost efficiency to between 38 and 60 percent. So, from 40 to 85 percent of the fuel burned produces no electric power. But air pollution and global warming gases are created by combustion whether power is produced or not.

Moreover, how the turbine is operated affects air pollution emissions and efficiency. Duke Energy Progress has trimmed its application to escape requirements of BACT and MACT by reducing hours of operation for some units with negative consequences; e.g., Turbine Units ES-13 and ES-14 are to operate for 1000 or 2000 hours per year burning fuel oil or natural gas, respectively. This would result in underestimated levels of toxic air pollution.

> Available emissions data indicate that the turbineôs operating load has a considerable effect on the resulting emission levels. Gas turbines are typically operated at high loads (greater than or equal to 80 percent of rated capacity) to achieve maximum thermal efficiency and peak combustor zone flame temperatures. With reduced loads (lower than 80 percent), or during periods of frequent load changes, the combustor zone flame temperatures are expected to be lower than the high load temperatures, yielding lower thermal efficiencies and more incomplete combustion.[2]

The products of incomplete productionð carbon monoxide and PM-10ð increase with reduced operating loads. So in addition to escaping Clean Air Act provisions, Dukeôs regulatory stratagem of reducing hours of operation will create higher levels of pollution per kilowatt-hour. Before issuing this permit, the Division must assess the anomalous impact of the apparent attempt by the applicant to game the system. Best available control technology for criteria pollutants and maximum achievable control technology for hazardous air pollutants are the standards which should be required for the Richmond County Combustion Turbines Title V permit.

If approved as written, the draft permit for the Richmond County Turbines would allow significant modification of the facility. The permit must comply with the air quality permitting program under Title V and 40 CFR Part 70 (15A NCAC 2Q .0501), but the removal of several emissions sources operating within the energy complex, the removal of alternative compliance procedures under several MACT sources and alterations in enforcement of rule requirements make the draft permit unacceptable.

Duke Energy Progress Side-steps Sulfur Dioxide Best Available Control Technology

Previously, the proposed project was subject to state-only BACT requirements for SO2 (15A NCAC 2D .0530(h)) because, if cost recovery is sought pursuant to the NC Clean Smokestacks Act (G.S. 62-133.6), new natural gas-fired electric generating units must install best available control technology for NOx and SO2. However, Duke Energy Progress will not seek cost

[1] US EPA Air Pollution Emission Factors, AP-42, Stationary Gas Turbines, Section 3.1.2 Process Description
[2] *Id.* Page 3.1-3

recovery and has requested that SO2 BACT emission limits the new combustion turbines (ID Nos. ES-13 and ES-14) be removed from the permit. The Division of Air Quality must justify how the groundbreaking statewide air pollution advance of the last decade has been side-stepped by Duke Energy Progress at this time in this place.

Duke Energy Progress Plays Pollution Shell Game

The Richmond County plant has three natural gas fired heaters (ES-21, ES-22 and ES-23) with a heat input of 8.75 MMBtu/hr each. In their permit application submitted in 2008, three additional natural gas fired heaters (ES-16, ES-17 and ES-18) with a heat rating of 5.0 MMBtu/hr were to be added to the permit. However, Duke requested that the DAQ remove all six of these natural gas fired units from their permit. These heaters are located within the fence line of the Richmond County facility but owned and operated by Piedmont Natural Gas.

The federal Clean Ait Act Title V operating permit program requires that major industrial sources and certain other sources obtain a permit that consolidates all of the applicable requirements for a facility into one document. The Richmond County Energy Complex is a single site with co-located air pollution emission sources. The purpose of title V permits is to reduce violations of air pollution laws and improve enforcement of those laws. The DAQ should not allow the six combustions sources to be separated from the existing permit.

Permit Incorrectly Delays Hazardous Air Pollutant Controls

Combustion turbines ES-13 and ES-14 are classified as new stationary sources for the purpose of MACT (maximum achievable control technology). Any new or reconstructed unit which is a *lean premix oil-fired stationary combustion turbine* commencing operation after March 5, 2004 must comply with the emissions and operating limits in 40 CFR § 63.6095(a)(2). In the draft permit, these units are permitted to burn fuel oil up to 1000 hours per year and natural gas up to 2000 hours per year. Notwithstanding the US EPA stay of standards which applies to *lean premix gas-fired stationary combustion turbines*, as referenced in the Divisions Air Permit Review, these two units must meet the standards of 40 CFR § 63 including MACT.[3] In lean-premix combustors the fuel is mixed before entering the power producing combustion chamber. The purpose of Subpart YYYY of this rule is to limit hazardous air pollutants from stationary combustion turbines located at major sources of HAP emissions, and requirements to demonstrate initial and continuous compliance with the emission and operating limitations. The draft permit would allow excessive emissions of toxic air pollutants. We request a public hearing on the draft permit be held, at which time we will present detailed analyses of the impacts on public health.

Conclusion

In summary, the draft permit would allow excessive emissions of toxic air pollutants which would have a negative impact on public health. We recommend that the Division reject this permit and begin anew. Further, on behalf of our members in Richmond County and North

[3] 40 CFR 63, Subpart YYYY - National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

Carolina, we request that a public hearing on the draft permit be held, at which time we will present further, detailed analyses of the impacts on public health.

Respectfully submitted,

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