

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
REGION 4  
ATLANTA FEDERAL CENTER  
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4APT-ARB

Dr. Donald R. van der Vaart, Ph.D., P.E.  
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North Carolina Department of Environment and Natural Resources  
P.O. Box 29580  
Raleigh, NC 27626-0580

**SUBJ: Permitting Considerations for Installation of Inlet Air Foggers on Simple Cycle  
Combustion Turbines at the Duke Power Lincoln Combustion Turbine Facility**

Dear Dr. van der Vaart:

Thank you for your request for an opinion on prevention of significant deterioration (PSD) permitting considerations for a proposed Duke Power project. This project involves the installation of inlet air foggers on combustion turbines (CTs) in operation at the Duke Power Lincoln Combustion Turbine Facility. Duke Power operates 16 simple cycle CTs at the Lincoln facility and proposes to install inlet air foggers on each CT. The purpose of installing inlet air foggers is to increase power output during periods of high ambient temperatures.

On February 28, 2000, we met with Duke Power to discuss the proposed project. The North Carolina Division of Air Quality (NCDAQ) participated in this meeting by telephone. Duke Power presented information about the project, and both Duke Power and NCDAQ asked for an opinion from Region 4 on whether an acceptable procedure exists for permitting the proposed project without triggering PSD review. This letter provides our opinion.

#### **BACKGROUND**

The following items outline our understanding of the operating characteristics and regulatory considerations that apply to the Lincoln facility:

1. The facility is a major source for PSD purposes and previously underwent PSD review including an ambient air quality modeling analysis.
2. Maximum short-term emissions will not change from those indicated in the original permit application and/or the current permit. Maximum short-term emissions occur during cold ambient temperature conditions when foggers can not operate.

3. During all ambient temperature conditions, including high ambient temperature conditions, the individual combustion turbines are allowed to operate in peak firing mode. Allowable short-term emissions during peak firing are higher than expected maximum short-term emissions when foggers are in use and turbines are not in peak firing mode. The foggers can be used when the turbines are in peak firing mode.
4. The foggers can be turned on or off at will. When the foggers are off, the turbines will operate just as they do now. In other words, the installation of foggers does not alter the equipment now in use or change the operation or emission characteristics of the turbines when foggers are not operating.
4. The use of foggers does not necessitate combustion of a different fuel or create greater reliance on fuel oil combustion rather than natural gas combustion.
5. Use of foggers allows combustion of additional fuel and, thus, greater power output at the same ambient temperature. Despite more fuel combustion, the possibility exists that nitrogen oxides (NO<sub>x</sub>) emissions actually decrease when foggers are turned on. However, Duke Power has taken the conservative position that NO<sub>x</sub> emissions (as well as emissions of other combustion-related pollutants) will increase when foggers are in use.

## CONCLUSIONS AND RECOMMENDATIONS

Following are our conclusions and recommendations taking into account the background items above:

1. The addition of foggers is a modification subject to a PSD applicability determination.
2. We concur with the position taken by both Duke Power and NCDAQ that the proposed installation of foggers is not eligible for the provisions of PSD regulations that pertain to modifications of electric utility steam generators. The combustion turbines at the Lincoln facility are simple cycle CTs with no steam generation.
3. A major modification is defined by applicable PSD regulations as “any physical change or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act.” A net emissions increase is determined by the difference between past actual emissions compared to future potential emissions, where past actual emissions equal average emissions during the previous two-year period prior to the modification unless the permitting agency decides that another period is more representative of normal source operation.

In this case, the only physical change or change in the method of operation occurs when foggers are in use. At other times, the combustion turbines will operate as they do

currently. Furthermore, we understand that foggers can only be used during months with high ambient temperatures and that Duke Power is willing to accept a restriction limiting operation to certain high-temperature months of the year. (For purposes of this letter, we refer to these months as the restricted period.) With this restriction, Region 4 will agree that the net emissions change associated with the foggers modification can be calculated as follows:

- Calculate past actual average emissions for the entire facility during the restricted periods in 1998 and 1999.
- Calculate total future potential emissions for the entire facility when foggers are in use during the restricted period. This calculation should account for times when the combustion turbines operate in peak generating mode concurrent with foggers in use. It can also take into account federally enforceable limitations on the number of hours with foggers in operation and the number of hours in peak generating mode concurrent with fogger use.
- Calculate the difference between future potential emissions with foggers in use during the restricted period and past actual emissions for the restricted period when foggers could operate.

If the calculated differences between future potential and past actual emissions are less than the PSD significant emission increase levels for all relevant pollutants, Region 4 will concur that the installation and operation of foggers does not trigger the need for PSD review.

4. NCDAQ should restrict fogger use to the months assumed by Duke Power in calculating net emissions changes.
5. NCDAQ should retain all other permit conditions now in effect including the NO<sub>x</sub> annual emissions limit of 3,600 tons per year.
6. Before NCDAQ reaches a determination on PSD applicability, we recommend that either Duke Power or NCDAQ make an assessment to confirm that the previous modeling evaluation for the Lincoln facility still represents an analysis of worst-case conditions. This should be done for all pollutants previously modeled whose short-term emission rates could increase as a result of using foggers.
7. As the permitting agency, NCDAQ will determine PSD applicability in this case. Should NCDAQ determine that the installation of foggers is a major modification requiring PSD review, we would support NCDAQ's determination.

If you have any questions concerning the comments in this letter, please contact Jim Little at (404) 562-9118.

Sincerely,

R. Douglas Neeley  
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