



COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southwest Regional Office
September 28, 2004

SUBJECT: Review of Application
Draft Title V Operating Permit
Allegheny Energy Supply Company, LLC
Gans Turbine Station
Springhill Township
Fayette County

TO: Air Quality Permit File #26-00495

THROUGH: Thomas J. Joseph 
Acting Facilities Permitting Chief
Air Quality

FROM: Nicholas J. Waryanka 
Facilities Permitting
Air Quality

BACKGROUND

Allegheny Energy Supply Company LLC (AES) is an electric power generating company which operates several generating facilities in the Southwest Region. Operation of the equipment at Gans Turbine Station (Gans) results in the emission of various air contaminants. As a result of the levels of carbon monoxide (CO) emitted, Gans is a major stationary source as defined in Title I, Part D of the Clean Air Act Amendments. As such, the facility is subject to the Title V permitting requirements adopted at 25 Pa. Code, Chapter 127, Subchapter G.

A Plan Approval was issued to AES on July 6, 2000 to allow construction of the station located in Springhill Township, Fayette County. The facility consists of two simple cycle combustion cycle turbines (CTs) rated at a nominal 44 MW each. They are permitted to combust natural gas but may use low sulfur diesel fuel as backup. The units started up on November 22, 2000. The CTs were operating under the terms of the Plan Approval until its expiration on September 17, 2001. The Department received a Title V Operating Permit Application on May 18, 2001. The application was incomplete but the Department failed to make a determination within the 60 day time period required by 25 Pa. Code Section 127.421. As a result the facility was authorized to operate under an application shield as described in 25 Pa. Code Section 127.505(e). After receiving the balance of the required permitting fee, the application was deemed administratively complete on January 24, 2002.

The Gans Turbine Station is nearly identical to another AES facility in Franklin County, PA. Title V Operating Permit #28-05028 was issued for the Chambersburg Station on May 19, 2003 by our Southcentral Regional Office. As such, an effort was made to make the Gans permit reflect Chambersburg's as closely as possible.

REGULATORY REVIEW

The turbines are subject to the applicable requirements of 40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines. Subpart GG establishes NOx and SO2 emission limitations, monitoring, testing, recordkeeping and reporting requirements. However, since the standards were established in 1982, technological advances in turbine design have resulted in lower emission rates being established under BAT provisions.

In addition, AES requested and was granted approval by the US EPA for the waiver of several Subpart GG monitoring requirements. These include the following:

1. A custom fuel monitoring schedule for fuel sulfur content in pipeline quality natural gas.
2. A waiver of the requirement for fuel nitrogen monitoring as allowed under EPA's 1987 Policy.
3. A waiver of the requirement to monitor water-to-fuel ratio for water injection NOx control.
4. An allowance for the use of Part 75-certified Continuous Emission Monitors for measuring NOx emissions.
5. An allowance to not correct NOx emissions to ISO conditions for excess emission reporting purposes.
6. A waiver of the requirement to test at multiple load points during the initial performance test as required by Section 60.8 of the General Provisions of the NSPS Program. They will only test at maximum load.
7. The use of the initial Relative Accuracy Test Audit testing for NOx emissions in lieu of the initial performance test requirements as specified in Subpart GG.

The waivers of these requirements were addressed in the Title V permit with the use of appropriate streamlined permit conditions.

The plan approval allowed for construction of a 500,000-gallon low-sulfur diesel fuel storage tank which was never installed. AES would like to retain the option to construct the tank in the future. However, the tank cannot be built under the plan approval since it has long since expired. We have advised AES to submit a Request for Determination of Plan Approval should the company decide to install the tank in the future. We would consider granting an exemption from plan approval requirements and having AES execute a minor operating permit modification to incorporate it into their existing Title V permit.

In the event it is constructed, the tank would be subject to 40 CFR 60, Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels since it has a capacity greater than 40 m³ (10,600 gallons). Since the tank is larger than 151 m³ (39,900 gallons) and is used to store a material with a maximum true vapor pressure of less than 3.5 kPa (26.25 mmHg) it is covered by 40 CFR § 60.110b(c) which states that the tank is exempt from the General Provisions of 40 CFR 60, Subpart A, and from the other provisions of the subpart, except that 40 CFR § 60.116b does apply. Therefore, the only applicable requirement for this source is that the permittee keep a record of the dimensions and capacity of the storage tank, and that the permittee notify the administrator within 30 days should the tank ever be used to store liquid whose vapor pressure is in excess of 5.2 kPa (39 mmHg).

The combustion turbines are subject to the Title IV Acid Rain Program of the 1990 Clean Air Act Amendments, and are required to comply with all applicable provisions of that Title, including 40 CFR Part 72 (Permits Regulations), 40 CFR Part 73 (Sulfur Dioxide Allowance System), 40 CFR Part 75 (Continuous Emissions Monitoring), and 40 CFR Part 77 (Excess Emissions). These requirements have been incorporated into the proposed Title V Operating Permit by reference.

Since the turbines are fossil fuel fired electric generating facilities rated at 15 megawatts or more, they meet the definition of NO_x affected source found in 25 PA Code, § 121.1. As such, they are subject to the applicable requirements of the NO_x Budget Program established at 25 PA Code, §§ 123.102 – 123.120.

EMISSION INFORMATION

The CTs are the only significant emission sources at the facility and are designated as Source #101 (Unit 8) and #102 (Unit 9). Control devices #C101 and #C102 represent the CTs water injection systems for NO_x control and are included in the permit for Source #101 and #102, respectively.

The CTs have NO_x limitations of 25 ppm (natural gas-fired), 42 ppm (diesel-fired), 41 lb/hr/unit (natural gas-fired), 71 lb/hr/unit (diesel-fired), and a facility NO_x cap of 99.9 tons/year. Both CTs are equipped with NO_x CEMS to continuously monitor NO_x emissions.

The CTs supply energy to the grid during times of extreme heat or cold to supplement existing electric power supplies (peaking station). As such, their operation is generally seasonal and sporadic. When these types of units are started up, there is a short time period after ignition and before the flame can be stabilized, that the water injection cannot be operated or it would extinguish the flame and destabilize the units. This sequence is inherent to the design of simple cycle combustion turbines equipped with water injection for NO_x control. From the time of ignition until the system has stabilized and the water injection is initiated, the NO_x levels sometimes spike above 25 ppm for a short period of time. These NO_x spikes are also experienced during the shutdown of the units. Since the installed CEMS measure NO_x emissions during all times that the CTs are operational, average hourly NO_x levels greater than 25 ppm are almost always experienced during the first and last hour of operation. Additionally,

the first or last clock hour of operation often ends up being a partial hour. When this occurs, it also leads to a high hourly average for the first or last hour of operation, since the CEMS hourly averages do not count the zero values of the non-operating portion of the hour when calculating hourly averages.

Although they are short and transient, these time periods were being identified as exceedances in the quarterly CEMS reports. To resolve this situation, the plan approval was modified to include a condition allowing an exemption from the short-term NOx emission limitations during the startup and shutdown periods. The NOx emissions measured during the startup and shutdown periods will be counted towards the long term annual NOx emission caps for the facility, however.

Besides those already acknowledged by the Department, additional trivial activities are listed in Section H of the proposed permit under **Miscellaneous**.

OPERATIONAL FLEXIBILITY

The Title V permit may include provisions to allow a permitted facility to make certain changes without requiring a permit revision. No alternate operating scenarios were proposed. AES has requested that the permit shield be granted for this permit. The permit shield has been specified in the permit special conditions.

CONCLUSIONS AND RECOMMENDATIONS

I have completed my review of AES's Title V permit application for their Gans Turbine Station. AES has met the regulatory requirements associated with this application submittal. The attached draft permit reflects terms and conditions as described in AES's permit application. It is my recommendation to issue a Title V permit for this facility.