August 18, 2016

Ms. Bobbie Hull
Alternate Designated Representative
AES Shady Point
P.O. Box 1740
Panama, OK 74951

Re: Petition for approval to use an alternative flow monitoring methodology for Units 1A, 1B, 2A, and 2B at AES Shady Point (Facility ID (ORISPL) 10671)

Dear Ms. Hull:

The United States Environmental Protection Agency (EPA) has reviewed the May 1, 2015 petition and subsequent certification statement submitted on June 2, 2016 by AES Shady Point requesting an approval of an alternative stack gas flow rate monitoring procedure for Units 1A, 1B, 2A, and 2B. EPA approves the petition, with conditions, as discussed below.

Background

The AES Shady Point (AES-SP) co-generation facility, located in Panama, Oklahoma, consists of four boilers and two turbine/generator units with a net electric generating capability of 360 MW. The steam generators are circulating fluidized bed (CFB) boilers fired with coal as the primary fuel and natural gas as the secondary/startup fuel. The facility also supplies process steam and a slip stream of exhaust gas from its single combined stack to an on-site CO_2 recovery plant, owned and operated by AES-SP LLC, for the production of food-grade liquid carbon dioxide (CO_2). The slip stream of boiler exhaust gas used for the CO_2 process is extracted from the base of the power plant stack through an isolation valve prior to emissions monitoring.

AES-SP Units 1A, 1B, 2A, and 2B are subject to the Cross-State Air Pollution Rule (CSAPR) trading program for ozone season emissions of nitrogen oxides (NO_X). AES-SP is therefore required to continuously monitor and report NO_X mass emissions and heat input rate for each of the units in accordance with 40 CFR part 75. To meet these requirements, AES-SP has installed and certified a NO_X concentration continuous emission monitoring system (CEMS), a CO_2 CEMS, and a stack gas flow rate CEMS on the common stack (CS1) used by all four units.

Due to the nature of the cogeneration process at AES-SP (i.e., a gas slip stream diverted to the CO_2 production facility), there are times when not all of the exhaust gas from Units 1A, 1B, 2A, and 2B exits to the atmosphere through the common stack. This occurs whenever a slip stream is extracted from the exhaust gas ductwork upstream of the stack and routed to the CO_2 recovery plant. The slip stream is extracted using two blowers, each with a full-capacity inlet volume rating of 12,723 dry standard cubic feet per minute (dscfm). Therefore, the assumed flow rate of the slip stream with both blowers in operation is 25,446 dscfm. According to AES-SP, the total slip stream flow with both blowers in operation, adjusted for moisture, and based on historical flow data, is up to 28,200 wet scfm (wscfm). The extraction with two blowers in operation is approximately 2-4% of the stack gas flow at full load. In the equations used by AES-SP to compute the NO_X mass emissions to be reported to EPA, those emissions are dependent on, and proportional to, the stack gas flow. Thus, while at least 96% of the exhaust gas from the AES-SP units will flow through the common stack and be monitored with a certified CEMS, unless the exhaust gas in the slip stream is also accounted for, the NO_X mass emissions from the combustion process will be underreported.

In the June 2, 2016 letter, AES-SP stated that the CEMS programmable logic controller (PLC) monitors the operation of the slip-stream flue gas blowers by receiving a digital signal. When the slip-stream flue gas blowers are not operating, the isolation valve in the slip-stream ductwork upstream of the stack is closed. AES-SP proposed to account for the slip-stream exhaust gas by adding 28,200 wscfm to the measured stack gas flow in common stack CS1 whenever the slip-stream flue gas blowers are in operation. The adjustments would be performed by the CEMS Data Acquisition and Handling System (DAHS) prior to submittal of stack gas flow and emissions data to the EPA. The concentration of NO_X in the slip-stream exhaust is assumed to be equal to the concentration of NO_X in the exhaust measured by the CEMS in the common stack.

EPA's Determination

EPA finds that the alternative flow measurement methodology proposed by AES-SP ensures that NO_X mass emissions from Units 1A, 1B, 2A, and 2B will not be underestimated. AES-SP's proposal to add a default value of 28,200 wscfm to the stack gas flow rate measured by the CEMS when either one or two blowers are in operation adequately compensates for the extraction of the slip-stream exhaust gas. EPA therefore approves the use of this default value for the purposes of reporting data under CSAPR, subject to the following conditions of approval:

1) AES-SP shall perform a DAHS verification to demonstrate that 28,200 wscfm is being added to the measured stack flow rate when the slip-stream exhaust gas is extracted. The results of this demonstration shall be kept on-site in a format suitable for inspection.

2) For any hour in which the slip-stream exhaust gas is being extracted but the digital signal to the PLC is either missing, invalid, or not interpretable, AES-SP shall add 28,200 wscfm to the measured stack flow rate.

3) AES-SP shall perform relative accuracy test audits (RATAs) of the flow monitor as described in (a) or (b) below. That is, AES-SP shall either:

   a) Conduct the RATA testing at a time when the CO_2 slip stream is not being extracted; or

   b) If the slip-stream exhaust gas is being extracted at the time of the RATA, compare the *unadjusted* flow rates measured by the monitor (i.e., with no correction factor for the slip-stream volume) against the reference method measurements.

EPA's determination relies on the accuracy and completeness of the information provided by AES-SP in the May 1, 2015 petition, as well as the certification statement submitted on June 2, 2016, and is appealable under 40 CFR part 78. If you have any questions or concerns about this determination, please contact Travis Johnson, at (202) 343-9018. Thank you for your continued cooperation.

Sincerely,

/s/
Karen Orehowsky, Acting Director
Clean Air Markets Division

cc: Travis Johnson, CAMD
Raymond Magyar, EPA Region VI
Sandy Simko, Texas TCEQ