November 13, 2019

Ms. Susan B. Comensky
Vice President Environmental Affairs
Alternate Designated Representative
Alabama Power Company
600 North 18th Street
Birmingham, AL 35291

Re: Request for Alternative Stratification Test Procedure at multiple units at the Barry, Gadsden, Gaston, Greene County, Miller, Theodore, and Washington County power plants operated by Alabama Power Company.

Dear Ms. Comensky,

The United States Environmental Protection Agency (EPA) has reviewed the July 30, 2019 petition submitted under 40 CFR 75.66 by Alabama Power Company (Alabama Power) for 32 electricity generating units (EGUs) at seven Alabama Power facilities requesting authorization to perform stratification testing with a procedural modification to address temporal variations in stack gas concentrations. Specifically, Alabama Power requested authorization to modify the stratification test procedures set forth in sections 6.5.6.1, 6.5.6.2, and 6.5.6.3 of appendix A to part 75 using the normalization procedure for temporal variations set forth in section 8.1.3.3 of EPA Method 30A (refer to appendix A-8 to 40 CFR part 60). EPA approves the petition, with conditions, as discussed below.

Background

Alabama Power operates and owns or co-owns numerous electricity generating units in Alabama including the following 32 fossil fuel-fired boilers and combustion turbines, each of which serves a generator with a capacity rating greater than 25 MW: Barry (ORISPL 3) units 1, 2, 4, 5, 6A, 6B, 7A, and 7B; Gadsden (ORISPL 7) units 1 and 2; Gaston (ORISPL 26) units 1, 2, 3, 4, and 5; Greene County (ORISPL 10) units 1, 2, CT2, CT3, CT4, CT5, CT6, CT7, CT8, CT9, and CT10; Miller (ORISPL 6002) units 1, 2, 3, and 4; Theodore (ORISPL 7721) unit CC1; and Washington County (ORISPL 7697) unit CC1. According to Alabama Power, each of these units is subject to the Acid Rain Program and trading programs under the Cross-State Air Pollution Rule. Alabama Power is therefore required to continuously monitor and report the units' sulfur dioxide (SO_2), nitrogen oxides (NO_X), and carbon dioxide (CO_2) emissions and heat input in accordance with part 75. As part of its approach for meeting these requirements, Alabama Power has installed and certified continuous emission monitoring systems (CEMS) to continuously measure the concentrations of NO_X, CO_2, and, for some units, SO_2 in the flue

gas exhausted from each unit. Data from these gas concentration CEMS are combined with data from stack gas flow rate CEMS at some units, and data from fuel flowmeters and fuel sampling and analysis at other units, to determine the emissions and heat input data reported for the units under part 75.

Part 75 requires periodic (semiannual or annual) relative accuracy test audits (RATAs) of gas concentration CEMS for quality-assurance purposes. Section 6.5.6 of appendix A to part 75 provides several options for determining the location and number of traverse points from which sample measurements must be taken when performing a gas RATA. Under these options, for a given gas RATA, a unit may qualify to conduct testing at a reduced number of traverse points based on the results of stratification testing performed immediately prior to the RATA.

Alabama Power uses an internal stack testing group, Air Field Services (AFS), to perform RATAs. In the July 30, 2019 petition, Alabama Power stated that AFS typically uses the procedures outlined in sections 6.5.6.1, 6.5.6.2, and 6.5.6.3 of appendix A to part 75 to perform stratification tests prior to each gas RATA for the units listed above. Alabama Power is requesting the ability to modify the stratification testing procedures as set forth in these part 75 provisions by using the temporal variation correction procedures set forth in section 8.1.3.3 of EPA Method 30A (refer to appendix A-8 to part 60). Based on its observations, analysis, and previous test results, Alabama Power believes that stratification test results reflecting the temporal variation correction procedures described in section 8.1.3.3 of EPA Method 30A will provide a better representation of actual stratification for the units identified in the petition than stratification test results not reflecting the requested procedures.

The EPA Method 30A procedures are intended to normalize gas concentration measurements taken during a stratification test in order to account for temporal variations in gas concentrations that "may complicate the determination of stratification" (refer to section 8.1.3.3 of EPA Method 30A in appendix A-8 to part 60). Under the Method 30A procedures, while conducting gas concentration measurements at multiple traverse points in order to check for stratification, the tester simultaneously conducts gas concentration measurements at a fixed point. Once the two sets of measurements have been obtained, the tester accounts for temporal variation by normalizing the traverse point measurements to account for changes in gas concentration over the time required to complete the stratification test. Specifically, the tester multiplies the measurement at each traverse point by the ratio of (i) the average of all the values measured at the fixed point over the duration of the entire stratification test to (ii) the value measured at the fixed point simultaneously with that particular traverse point measurement. In order to apply this procedure to stratification testing at all the Alabama Power facilities and units listed above, Alabama Power is proposing to use CEMS measurements as the fixed-point measurements that would be taken simultaneously with the traverse point measurements.

To support this proposed normalization procedure, Alabama Power provided the results of a series of stratification tests that were performed prior to a gas RATA in 2018 at Gaston unit 5. Alabama Power demonstrated that even though there was variation in measured gas concentrations across the traverse points, the gas concentration measurements taken at the various traverse points using the reference method closely track the simultaneous CEMS measurements taken at a fixed point throughout the duration of the various stratification tests.[1]

[1] Alabama Power provided results in the petition dated July 30, 2019. Refer to figure 1 and tables 3 and 4 in the petition.

EPA's Determination

EPA agrees that the stratification test procedures in sections 6.5.6.1, 6.5.6.2, and 6.5.6.3 of appendix A to part 75 do not take into account temporal variations in pollutant concentrations that may occur as a result of process changes during the test. EPA also agrees that modifying the stratification test procedure by normalizing stratification test results using the EPA-developed and approved procedure found in section 8.1.3.3 of Method 30A will help to address temporal variations. EPA notes that similar requests have previously been approved for other power plants.[2]

EPA approves Alabama Power's request to modify the stratification test procedures in sections 6.5.6.1, 6.5.6.2, and 6.5.6.3 of appendix A to part 75 to correct for temporal variation in gas concentrations at the units listed above. Depending on the test results, the modified test may be used to qualify to perform a gas RATA at a test location using either a single reference method measurement point as described in section 6.5.6(b)(4) of appendix A or using a short reference method measurement line as described in section 6.5.6(b)(3) of appendix A. The modified stratification test must be performed for each gas measured at that test location and the results of the modified test for each gas must meet the relevant acceptance criteria in section 6.5.6.3.

To correct for temporal variations in the 12-point stratification test described in section 6.5.6.1, Alabama Power (or its contractor) must proceed as follows: First, in addition to collecting gas concentration measurements at 12 traverse points according to the procedures set forth in section 6.5.6, Alabama Power must collect gas concentration measurements for each gas measured at the test location at a fixed measurement point at least one meter from the stack or duct wall. To provide the fixed-point data, Alabama Power may use either a second reference method sampling system or quality-assured data from an installed CEMS. The fixed-point data must be collected throughout the entire stratification test, including measurements taken concurrently with the measurements collected at the 12 traverse points. Second, to normalize the data collected at each traverse point, Alabama Power must multiply the measured concentration at each traverse point by the ratio of $C_{F,\,avg}$ to $C_{F,}$ where C_F is the simultaneous fixed-point concentration measurement and $C_{F,\,avg}$ is the average of all the fixed-point measurements over the duration of the stratification test.

To determine whether or not the results of the normalized 12-point stratification test for a particular gas meet the acceptance criteria in sections 6.5.6.3(a) or (b) of appendix A, Alabama Power must calculate the arithmetic average of the normalized concentrations for that gas across all traverse points and determine the percent deviation of the normalized concentration at each traverse point from the arithmetic average of the normalized concentrations across all traverse points. This procedure should be performed for each of the gases being measured at the test location. If the calculated percent deviations for all gases measured at the test location meet the acceptance criteria in section 6.5.6.3(b) of appendix A, the single reference method measurement point may be used when performing the RATA for the gases at that test location. If the calculated percent deviations for one or more gases do not meet the acceptance criteria in section 6.5.6.3(b) but the calculated percent deviations for all gases meet the acceptance criteria in section 6.5.6.3(a), the short reference method measurement line described in section 6.5.6(b)(3) may be used when performing the RATA for the gases at that test location. Alabama Power must keep records of the raw data and calculated test results of the modified stratification tests (refer to § 75.59(a)(7)(vi)).

[2] Refer to EPA response to petition for Merrimack power plant (February 8, 2018); EPA response to petition for Winyah power plant (September 10, 2018).

If Alabama Power chooses to perform the 3-point or 6-point abbreviated stratification test described in section 6.5.6.2 immediately prior to a gas RATA in order to qualify to use a short reference method measurement line for that RATA, the procedure described above may be used to normalize the results of the 3-point or 6-point abbreviated stratification test, provided that a 12-point stratification test (which may reflect the normalization procedure described above) has been passed at that test location previously. The normalized results of an abbreviated stratification test may not be used to qualify for use of a single reference method measurement point, but in all other respects the normalization procedure requirements for a 3-point or 6-point abbreviated stratification test are identical to the normalization procedure requirements for a 12-point stratification test described above.

EPA's determination relies on the accuracy and completeness of information provided by Alabama Power in the July 30, 2019 petition and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Carlos Martinez at (202 343-9747) or through email at martinez.carlos@epa.gov. Thank you for your continued cooperation.

Sincerely,

/s/
Reid P. Harvey, Director
Clean Air Markets Division

cc: Dave McNeal, U.S. EPA, Region 4
Stephen M. Davidson, Alabama Department of Environmental Management
Carlos Martinez, CAMD
Wade Bice, Alabama Power Company