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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR - 3 2012

Mr. Mark Gouveia
Vice President, PJM South Coal Operations
GenOn Potomac River, LLC
8301 Professional Place, Suite 230
Landover, MD 20785

OFFICE OF
AIR AND RADIATION

Re: Petition to Accept the Results of June 2010 Relative Accuracy Test Audits at the Potomac River Station (Facility ID (ORISPL) 3788)

Dear Mr. Gouveia:

The United States Environmental Protection Agency (EPA) has reviewed the July 1, 2011 petition (as amended on December 22, 2011) submitted under §75.66 by GenOn Potomac River LLC (GenOn), in which GenOn requested that EPA accept the results of June 2010 relative accuracy test audits (RATAs) of certain continuous emission monitoring systems (CEMS) at the Potomac River Power Station. EPA approves the petition, as discussed below.

Background

GenOn owns and operates five coal-fired units, known as Units 1, 2, 3, 4, and 5, at the Potomac River Power Station (Potomac River), located in Alexandria, Virginia. These units are subject to the Acid Rain Program and to the Clean Air Interstate Rule (CAIR) annual and seasonal emissions trading programs. Therefore, GenOn is required to continuously monitor and report sulfur dioxide (SO₂), nitrogen oxides (NO_x), and carbon dioxide (CO₂) emissions and heat input for Potomac River Units 1 through 5 in accordance with 40 CFR Part 75. To meet these monitoring and reporting requirements, GenOn has installed and certified CEMS for SO₂, NO_x, CO₂, and stack gas flow rate at two common stacks, i.e., CSC12 (which serves Units 1 and 2) and CSC345 (which serves Units 3, 4, and 5).

Part 75 requires periodic (semiannual or annual) RATAs of the gas and flow rate monitoring systems, for quality-assurance purposes. During the June 2010 annual RATAs of the SO₂, NO_x, and CO₂ CEMS, reference method gas samples were collected at a single measurement point in each of the common stacks, without having conducted 12-point stratification tests prior to the RATAs, as required by section 6.5.6(b)(4) of Appendix A to Part 75. In order to qualify for single-point reference method (RM) sampling, a pre-test 12-point stratification test must be performed and passed to demonstrate that stratification is absent. However, GenOn's test contractor performed 3-point long-line stratification traverses instead of the required 12-point traverses prior to the June 2010 RATAs and assumed (incorrectly) that single-point sampling could be used because the three stratification test points met the acceptance criterion for single-point RM testing in Appendix A, section 6.5.6.3(b), i.e., for each

gas (SO₂, NO_x, and CO₂), the concentration measured at each individual traverse point was within ± 5.0 percent of the arithmetic average concentration for the three points. Nevertheless, despite this variance from the procedural requirements of Part 75, all of the RATAs were passed.

GenOn submitted hardcopy results of the RATAs to the Virginia Department of Environmental Quality (DEQ) for review. When the DEQ discovered that single-point reference method sampling had been used at CSC12 and CSC345 without conducting the required 12-point stratification tests, they informed GenOn that the RATAs would be considered invalid unless a credible technical argument could be provided to convince EPA to accept the test results. Invalidation of the RATAs would result in considerable data loss and would require GenOn to report conservatively high substitute data values until follow-up RATAs could be performed and passed.

In view of this, GenOn contacted the Clean Air Markets Division (CAMD), seeking a way to demonstrate to EPA's satisfaction that the June 2010 RATAs and subsequent hourly data should be accepted as valid. CAMD recommended that GenOn perform follow-up 12-point stratification testing and gas RATAs at CSC12 and CSC345 as soon as possible, reproducing (to the extent practicable) the operating conditions that occurred during the June 2010 RATAs. GenOn agreed to these conditions and conducted 12-point stratification tests and follow-up gas RATAs at CSC12 and CSC345 on December 2, 2010 and November 30, 2010 respectively.

Unfortunately, the 12-point stratification test for SO₂ at common stack CSC12 and the 12-point test for NO_x concentration at common stack CSC345 failed to meet the acceptance criteria for single-point reference method sampling in section 6.5.6.3(b) of Appendix A, and the absence of stratification could not be demonstrated at those stacks for those two pollutants. Despite this apparent setback, GenOn proceeded with the follow-up RATAs, using 3-point RM sampling. All of the RATAs were passed.

After completing the RATAs, GenOn examined the 12-point stratification test data more closely and became convinced that the apparent failure of the SO₂ stratification test at CSC12 and the NO_x stratification test at CSC345 was not caused by the presence of actual stratification (where pollutant concentration varies spatially over the cross-section of the stack), but rather was due to temporal variations in the pollutant concentrations during the tests.

The stratification test procedure in section 6.5.6.1 of Appendix A to Part 75 does not take into account temporal variations in the gas concentration that may occur during the 12-point traverse. However, EPA has developed and published a procedure for normalizing stratification test results that does address temporal variations. The procedure is found in section 8.1.3.3 of EPA Method 30A, which is an instrumental method for measuring the mercury (Hg) concentration in stack gas (see 40 CFR Part 60, Appendix A-8). To account for temporal variations in Hg concentration, auxiliary measurements of Hg concentration are made at a fixed point in the stack during the stratification test. Each traverse point is "normalized" by multiplying the measured the Hg concentration at the traverse point by the ratio of $C_{F,avg}$ to C_F , where C_F is the corresponding fixed-point Hg concentration measurement, and $C_{F,avg}$ is the average of all of the fixed-point measurements over the duration of the stratification test. The

arithmetic average of the normalized traverse points is then calculated and the deviation of each normalized point from the normalized average concentration is determined.

GenOn applied the Method 30A normalization procedure to the December 2, 2010 SO₂ stratification test data recorded at CSC12 and to the November 30, 2010 NO_x stratification test data recorded at CSC345. In each case, quality-assured one-minute average data recorded by the installed CEMS during the stratification test period provided the necessary fixed point measurements.

The results of the normalized SO₂ stratification test points at CSC12 met the alternative acceptance criteria in section 6.5.6.3(b) of Appendix A, i.e., all of the normalized test points were within ± 3 ppm of the normalized arithmetic average concentration, confirming that SO₂ stratification was not present. However, at CSC345, the absence of stratification was once again not confirmed; one of the normalized NO_x stratification test points failed to meet either the main acceptance criterion or the alternative criterion in section 6.5.6.3(b).

In an attempt to explain the apparent failure of the NO_x stratification test at CSC345, GenOn prepared a graph of the test data versus time, showing the NO_x concentration measured at each traverse point and the corresponding NO_x concentration measured at the fixed-point. The graph showed that the fixed-point measurements were not precisely synchronized with the traverse point measurements. GenOn believed that differences in the response times of the CEMS and the reference method system was the likely cause.

Upon further investigation, GenOn determined that a one-minute correction to the fixed-point measurements was needed to properly synchronize them with the stratification traverse point measurements. The CEMS data points were shifted back in time by one minute and the normalization procedure from Method 30A was reapplied. This time, all twelve of the normalized NO_x stratification test points at CSC345 met the main acceptance criterion in section 6.5.6.3(b) of Appendix A (i.e., all points were within ± 5.0 percent of the normalized average concentration for all traverse points), thereby demonstrating the absence of stratification and justifying the use of single-point reference method sampling (see February 8, 2012 e-mail from David Cramer of GenOn to Charles Frushour of EPA).¹

EPA's Determination

EPA has reviewed both the original ("as-tested") November 30 and December 2, 2010 12-point stratification test data for common stacks CSC12 and CSC345 and the normalized data, corrected for temporal variations. As a result, the Agency finds that:

- In this unique situation, normalization of the stratification test data is appropriate. Fixed-point measurements obtained from the installed CEMS clearly showed that the pollutant concentrations (most notably the SO₂ concentration at CSC12 and the NO_x concentration

¹ GenOn prepared similar graphs for the other gaseous species (SO₂ and CO₂) at CSC345 and applied this same one-minute shift to the fixed-point CEMS data. When the Method 30A normalization procedure was reapplied to the stratification traverse points, the results were the same---neither gas was found to be stratified.

at CSC345) varied significantly during the stratification tests;

- For CSC345, the graphs prepared by GenOn clearly show the need for a one-minute adjustment to the CEMS data points to properly synchronize the fixed-point and stratification traverse point measurements;
- The follow-up testing conducted at stacks CSC12 and CSC345 on December 2 and November 30, 2010, respectively, was conducted at conditions representative of the conditions that existed during the June 2010 RATAs (see Table 1 in GenOn's July 1, 2011 petition);
- Normalization of the December 2, 2010 stratification test data recorded at CSC12 has satisfactorily demonstrated the absence of stratification for SO₂, NO_x, and CO₂ at that measurement location; and
- Normalization and proper synchronization of the November 30, 2010 stratification test data recorded at CSC345 has satisfactorily demonstrated the absence of stratification for SO₂, NO_x, and CO₂ at that measurement location

In view of these considerations, EPA approves GenOn's July 1, 2011 petition (as amended on December 22, 2011) to accept as valid the results of the June 2010 RATAs of the SO₂, NO_x, and CO₂ monitoring systems on common stacks CSC12 and CSC345 at the Potomac River Station. Therefore, the data recorded by these CEMS for the remainder of 2010 may be reported as quality-assured, except for out of-control periods, as provided in §75.24.

EPA's determination relies on the accuracy and completeness of the information provided by GenOn in the July 1, 2011 petition (as amended on December 22, 2011) and the supplementary data provided to EPA via e-mail on October 12, 2011 and February 8, 2012, and is appealable under Part 78. If you have any questions regarding this determination, please contact Charles Frushour at (202) 343-9847. Thank you for your continued cooperation.

Sincerely,



Richard Haeuber, Acting Director
Clean Air Markets Division

cc: Leonard Hotham, USEPA Region III
James LaFratta, Virginia Department of Environmental Quality
Charles Frushour, CAMD ✓
Ujjval Shukla, CAMD
Kenon Smith, CAMD