



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

OFFICE OF AIR AND RADIATION

November 21, 2022

Mr. Craig R. Eckberg
Designated Representative
NRG Energy, Inc.
910 Louisiana St.
Houston, Texas 77002

Re: Petition to use alternative sampling procedures for appendix E NO_x emission rate testing on units THW51, THW52, THW53, THW54, THW55, and THW56 at T.H. Wharton Station (ORISPL 3469)

Dear Mr. Eckberg:

The United States Environmental Protection Agency (EPA) has reviewed the November 7, 2022 petition¹ submitted under 40 CFR 75.66 by NRG Energy, Inc. (NRG), and supplemental emails sent on November 7 and 8, 2022, requesting permission to use alternative sampling procedures for appendix E NO_x emission rate testing at units THW51, THW52, THW53, THW54, THW55 and THW56 at the T.H. Wharton Station (Wharton). EPA approves the petition, with conditions, as discussed below.

Background

NRG owns and operates Wharton units THW51 through THW56 in Harris County, Texas. These six units are identical natural gas-fired combustion turbines with a maximum heat input of 1087 mmBtu/hr and a maximum gross load of approximately 74 MW each. According to NRG, the units are subject to the Cross-State Air Pollution Rule trading programs for ozone season emissions of nitrogen oxides (NO_x). NRG is therefore required to continuously monitor and report NO_x mass emissions and heat input for these units in accordance with 40 CFR part 75.

To satisfy the part 75 requirements related to NO_x mass emissions, instead of installing and operating continuous emission monitoring systems (CEMS) on the units, NRG initially elected to use the optional excepted methodology set forth in 40 CFR 75.19 for gas- and oil-fired units that qualify as low mass emissions (LME) units. To remain qualified to use the LME methodology for purposes of reporting ozone season NO_x mass emissions, a unit may emit no more than 50

¹ The November 7, 2022 petition is a modified version of a petition dated March 11, 2022.

tons of NO_x during any ozone season.² During the 2021 ozone season, each of the Wharton units THW51 through THW56 reported more than 50 tons of NO_x mass emissions, thereby disqualifying each unit from using the LME methodology beyond December 31, 2022. To meet the units' monitoring and reporting obligations after December 31, 2022, NRG has elected to use the optional excepted methodology set forth in appendix E to part 75 for gas- and oil-fired units that meet the definition of "peaking unit" in 40 CFR 72.2.

Under the appendix E methodology, a unit's owner or operator conducts testing and develops correlation curves representing the relationship of the unit's NO_x emission rate (in lb/mmBtu) to its heat input rate (in mmBtu/hr). The correlation curves are then used in conjunction with the unit's reported heat input rate to determine the unit's reported NO_x emission rate and/or NO_x mass emissions.³ Separate correlation curves must be developed for each non-emergency fuel or consistent combination of fuels combusted by the unit. Each correlation curve must be updated based on new testing at least once every 20 calendar quarters.

To develop each correlation curve, the owner or operator performs simultaneous three-run tests of NO_x and oxygen (O₂) concentration at each of four or more load levels representing the unit's full range of operations. Under section 2.1.2.2 of appendix E, for each test run at a combustion turbine, flue gas samples are taken from 12 points that traverse the stack in order to ensure that the NO_x emission rates computed from the flue gas samples reflect the unit's entire flue gas stream rather than an unrepresentative, stratified portion of the stream. A NO_x emission rate in lb/mmBtu is computed from each pair of NO_x and O₂ concentration data, and the NO_x emission rate for the tested load level is computed as the average of the NO_x emission rates from all sampling points for all three test runs for the load level. During the emissions tests, the owner or operator must also record fuel flow rate data that are used, in combination with gross calorific value for the fuel, to determine a heat input rate in mmBtu/hr for each tested load level. The average NO_x emission rates are then plotted against the corresponding heat input rates to form a correlation curve with one point for each tested load level.

In the November 7, 2022 petition, NRG requests permission to use an alternative to the appendix E procedures described above, both for purposes of establishing the initial correlation curves and for making the required periodic updates. Specifically, NRG requests permission to rely on stratification testing at each of the Wharton units following the procedures in section 6.5.6 of appendix A to 40 CFR part 75 as the basis for reducing the number of traverse points used in appendix E test runs at the units. Stratification testing would be performed at each tested load level, immediately prior to or concurrently with each appendix E correlation test. In support of this request, NRG cites other EPA petitions granting similar relief and regulations, including a provision of part 75, that allow the number of traverse points to be reduced in some of the test runs of a multi-run set of tests if the first test run in that set of runs indicates sufficiently low stratification.⁴ NRG states that granting the request would reduce the time for which the units are

² Limits on annual NO_x mass emissions and/or SO₂ mass emissions also apply where the unit is required or elects to report these emissions. See 40 CFR 75.19(a)(1)(i)(A).

³ See generally section 2 of appendix E to part 75.

⁴ See section 6.5.6 of appendix A to part 75.

operated solely to perform testing, the emissions associated with such operation, and the cost of the testing.

EPA's Determination

EPA approves the petition. EPA agrees that the results of a stratification test performed at each load level, immediately prior to or concurrently with each appendix E test, could verify that the concentration profile of the flue gases is not stratified, based on the acceptance criteria found in section 6.5.6.3 of appendix A, thereby reducing the number of traverse points necessary in additional test runs conducted for appendix E correlation testing at the same time.

Accordingly, NRG may perform stratification testing just prior to or concurrently with each future appendix E correlation test for Wharton units THW51 through THW56 and may use the stratification testing results, according to the acceptance criteria found in section 6.5.6.3 of appendix A, to reduce the minimum number of traverse points for subsequent appendix E test runs conducted at the units at that time. If the stratification test results meet the acceptance criteria in paragraph (b) of section 6.5.6.3 of appendix A, sampling for the subsequent test runs may be conducted at a single point meeting the requirements of that paragraph (b). If the stratification test results do not meet the acceptance criteria in paragraph (b) but do meet the acceptance criteria in paragraph (a) of section 6.5.6.3, sampling for the subsequent test runs may be conducted at three points meeting the requirements of paragraph (a). Separate stratification testing must be conducted for each fuel tested (if applicable) and at each load level tested, and all other requirements for appendix E testing continue to apply.

Conditions of Approval

1. For the purpose of NO_x emission rate testing under appendix E to part 75, in order to qualify to sample at fewer than 12 traverse points at a CT that is required to be tested while operating at a particular load level and burning either natural gas or distillate oil:
 - a. NRG must demonstrate immediately prior to or concurrently with each appendix E test that both the NO_x and O₂ concentrations, determined in accordance with section 6.5.6.1 of appendix A to part 75, meet the acceptance criteria in section 6.5.6.3 of appendix A to part 75 to qualify to use a reduced number of sampling points; and
 - b. The stratification testing must be conducted for each load level and each fuel tested and immediately prior to or concurrently with each appendix E test.
2. NRG may use the 12-point run used for the stratification testing as the first of the minimum required test runs for each tested load level and fuel.
3. For each test run for which sampling is conducted at fewer than 12 points, NRG must collect data for a minimum of 21 minutes per run for all sampling points in total (dividing the time equally among the sampling points), consistent with the minimum sampling times required under section 6.5.7 of appendix A to part 75. These minimum sampling times do not include the time required to ensure that the system has obtained stable stack gas readings (i.e., two measurement response times whenever the test probe is inserted at a new sampling port and

one measurement response time whenever the test probe is moved to a new sampling point using the same sampling port).

4. NRG must record, in a form suitable for inspection, the results of all performance testing including any stratification testing that was conducted, and must maintain those records for a minimum of three years from the date of the test in accordance with § 75.57(a).

EPA's determination relies on the accuracy and completeness of the information provided by NRG in the November 7, 2022 petition and is appealable under 40 CFR part 78. If you have any questions regarding this determination, please contact Charles Frushour by email at frushour.charles@epa.gov or by phone at 202-343-9847. Thank you for your continued cooperation.

Sincerely,

Rona Birnbaum, Director
Clean Air Markets Division

cc: Emad Shahin, EPA Region 6
Carolyn Maus, Texas Commission on Environmental Quality
Charles Frushour, EPA Clean Air Markets Division
Travis Johnson, EPA Clean Air Markets Division