



REGION 5

CHICAGO, IL 60604

ELECTRONIC MAIL
DELIVERY RECEIPT REQUESTED

Barry Marietta
Environmental Management & Safety Manager – Environmental Strategy
DTE Energy
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RE: Request for Operating Limits / Monitoring Petition under 40 C.F.R. Part 63, Subpart YYYYY, NESHAP for Stationary Combustion Turbines
DTE Gas Company: Belle River Mills, Milford, and Willow Run Compressor Stations in Michigan.

Dear Barry Marietta:

The U.S. Environmental Protection Agency (EPA) has received and reviewed three petitions dated June 16, 2022, from DTE Energy, doing business as DTE Gas Company (DTE or you), at three facilities in Michigan. The petitions request the use of Gas Producer Turbine Speed (%NGP) and Inlet Air Temperature (T1) for satisfying operating limits to demonstrate compliance with the formaldehyde emissions limitation for lean premix gas-fired combustion turbines under 40 C.F.R. § 63.6125(b) at DTE’s Belle River Mills (BRM), Milford, and Willow Run Compressor Stations in Michigan. In summary, EPA partially approves and partially denies the DTE petitions to use %NGP and T1 as operating limits under the regulations at 40 C.F.R. Part 63, Subpart YYYYY.

Regulatory Background

40 C.F.R. Part 63, Subpart YYYYY, National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines (Subpart YYYYY) establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emissions from stationary combustion turbines located at major stationary sources of HAP emissions, and requirements to demonstrate initial and continuous compliance with the emission and operating limitations.

40 C.F.R. § 63.6095(a)(3) requires the owner or operator of a new or reconstructed lean premix gas-fired stationary combustion turbine or a diffusion flame gas-fired stationary combustion turbine that started up on or before March 9, 2022, to comply with the emissions limitations and operating limitations of Subpart YYYYY no later than March 9, 2022.

40 C.F.R. § 63.6100 requires that each new or reconstructed lean premix gas-fired stationary combustion turbine must comply with the emission limitations and operating limitations in Table 1 and Table 2 of Subpart YYYYY. Table 1 provides that each new or reconstructed lean premix gas-fired

stationary combustion turbine must comply with an emission limit of 91 ppbvd formaldehyde or less at 15% O₂, except during turbine startup. The period for turbine startup is subject to the limits specified at 40 C.F.R. § 63.6175. Table 2 requires each stationary combustion turbine that is required to comply with the formaldehyde emissions limitation and is not using an oxidation catalyst to maintain any operating limitations approved by the Administrator.

40 C.F.R. § 63.6120(e) states that if the owner or operator's stationary combustion turbine is not equipped with an oxidation catalyst, it must petition the Administrator for operating limitations that it will monitor to demonstrate compliance with the formaldehyde emission limitation in Table 1. The owner or operator must measure these operating parameters during the initial performance test and continuously monitor thereafter. 40 C.F.R. § 63.6120(f) provides the specific information that must be included in a petition to the Administrator for approval of additional operating limitations to demonstrate compliance with the formaldehyde emission limitation in Table 1.

40 C.F.R. § 63.6125(b) requires that owners or operators of a stationary combustion turbine that is required to comply with the formaldehyde emission limitation and not using an oxidation catalyst must continuously monitor any parameters specified in the approved petition to comply with operating limitations specified in Table 2 and as specified in Table 5 of the Subpart.

All terms used in this letter have their ordinary meaning unless such terms are defined in the Clean Air Act, 42 U.S.C. §§ 7401 *et seq.*, or Subpart YYYY, in which case they have the meaning ascribed to them in those authorities.

DTE's Petitions

DTE owns and operates seven gas-fired lean premix stationary combustion turbines identified as Units 1, C50, and T70 at the BRM Compressor Station in China Township, Michigan; Units 1, 2, and 3 at the Milford Compressor Station in Milford, Michigan; and Unit 1 at the Willow Run Compressor Station in Ypsilanti, Michigan. The turbines were constructed after January 14, 2003, are not equipped with oxidation catalysts, and are "affected source[s]" under Subpart YYYY; therefore, the compliance deadline was March 9, 2022.

DTE submitted its petitions under 40 C.F.R. § 63.6120(e) for justifying the required information under 40 C.F.R. § 63.6120(f)(1) through (5). DTE requests that EPA accept monitoring of Lean Premix Mode (LPM), Gas Producer Turbine Speed (%NGP), and Inlet Air Temperature (T1) as parameters to meet the Subpart YYYY monitoring requirements for lean premix combustion equipped gas-fired turbines, instead of utilizing oxidation catalysts.

DTE claims that LPM "is dependent on" %NGP and T1. DTE claims that lean premix combustion provides "the mixing necessary to ensure complete combustion of the fuel and minimize emissions of CO and UHCs [unburned hydrocarbons] including formaldehyde."

EPA's Analysis

The petitions address the required information described in 40 C.F.R. § 63.6120(f)(1) through (5), as summarized below. EPA makes the following determinations regarding the lean premixed gas-fired

combustion turbines under Subpart YYYY, which are operating without oxidation catalysts, and are subject to emission and operating limitations.

Based on the information provided by DTE, EPA makes the following findings:

(1) DTE’s petitions clearly propose to monitor the identified %NGP and T1 parameters, along with monitoring LPM.

(2) DTE’s discussion in its petitions of the relationship between %NGP and T1, and formaldehyde emissions, and how limitations on these parameters will serve to limit formaldehyde emissions, is insufficient to support the requested parameters. The fact that a gas turbine is lean premix does not guarantee that it will meet the 91 ppbv formaldehyde standard. The August 23-25, 2022, February 21, 2023, and March 6-7, 2023 emissions testing conducted at BRM showed compliance with the formaldehyde standard within parts of the proposed ranges of %NGP and T1, with one exceedance. The July 27-28, 2022 emissions testing conducted at Milford showed compliance with the formaldehyde standard within parts of the proposed ranges of %NGP and T1. The August 8-9, 2022 and May 9, 2023 emissions testing conducted at Willow Run showed compliance with the formaldehyde standard within parts of the proposed ranges of %NGP and T1.

(3) In a March 23, 2023 letter, DTE proposed values for its proposed parameters (see table below). However, DTE proposed upper values for the T1 parameter, which were out of the range of test conditions. DTE proposed lower values for the %NGP parameter. DTE has not demonstrated that limiting operations to within the ranges of proposed values would ensure compliance.

%NGP Parameter:

Compressor Station	Unit	DTE Proposed Limits	Test Conditions		Approved Limits	
BRM	1	>90.0	103.0	103.0	94.5	105.0
BRM	C50	>87.5	98.6	100.0	91.0	100.0
BRM	T70	>98.0	99.1	100.0	98.0	103.0
Milford	1	>98.0	98.0	98.5	98.0	101.5
Milford	2	>98.0	99.7	99.9	98.0	102.9
Milford	3	>98.0	99.8	99.8	98.0	102.8
Willow Run	1	>86.5	98.4	98.8	89.5	101.8

T1 (°F) Parameter:

Compressor Station	Unit	DTE Proposed Limits	Test Conditions		Approved Limits	
BRM	1	<120	40.3	88.8	3.3	105.0
BRM	C50	<120	42.3	85.1	44.2	105.0
BRM	T70	<120	36.4	91.2	6.3	105.0
Milford	1	<120	75.8	80.8	52.6	103.8
Milford	2	<120	71.2	74.4	46.2	99.4
Milford	3	<120	72.0	76.7	46.7	100.5
Willow Run	1	<120	55.8	72.6	30.1	90.2

The acceptable lower T1 limits were set at the lowest temperature where compliance was demonstrated, because an exceedance occurred during the same test run at BRM unit C50; and otherwise calculated by:

$$\frac{[\text{Lowest temp tested at}] - ((91 \text{ ppb limit} - 5 \text{ ppb buffer} - [\text{Highest ppb tested at lower temperatures}])}{[\text{Testing Factor}]}$$
, where Testing Factor = 2 at BRM units 1 and 70, and 3 at Milford and Willow Run.

The acceptable upper T1 limits were calculated by:

$$\frac{[\text{Highest temp tested at}] - ((91 \text{ ppb limit} - 5 \text{ ppb buffer} - [\text{Highest ppb tested at higher temperatures}])}{[\text{Testing Factor}]}$$
, where Testing Factor = 2 at BRM, and 3 at Milford and Willow Run; and capped at 105 °F.

(4) In letters on 1/7/23 and 3/23/23, DTE described the methods it would use to measure and the instruments it would use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments. DTE provided the manufacturer documentation requested by EPA.

(5) In letters on 1/7/23 and 3/23/23, DTE described the frequency and methods of instrument recalibration it would use. DTE provided the manufacturer documentation requested by EPA.

DTE has not demonstrated that limiting operations to within the full ranges of proposed values of the parameters %NGP and T1 at the BRM Compressor Station would ensure compliance with the 91 ppbvd formaldehyde emissions standard. EPA therefore approves the petition for Unit 1 to operate between a T1 of 3.3-105.0 °F when the turbine is operating between 94.5-105.0% NGP, and in LPM; for Unit C50 to operate between a T1 of 44.2-105.0 °F when the turbine is operating between 91.0-100.0% NGP, and in LPM; and for Unit T70 to operate between a T1 of 6.3-105.0 °F when the turbine is operating between 98.0-103.0% NGP, and in LPM. EPA denies the petition for all other ranges.

DTE has not demonstrated that limiting operations to within the full ranges of proposed values of the parameters %NGP and T1 at the Milford Compressor Station would ensure compliance with the 91 ppbvd formaldehyde emissions standard. EPA therefore approves the petition for Unit 1 to operate between a T1 of 52.6-103.8 °F when the turbine is operating between 98.0-101.5% NGP, and in LPM; for Unit 2 to operate between a T1 of 46.2-99.4 °F when the turbine is operating between 98.0-102.9% NGP, and in LPM; and for Unit 3 to operate between a T1 of 46.7-100.5 °F when the turbine is operating between 98.0-102.8% NGP, and in LPM. EPA denies the petition for all other ranges.

DTE has not demonstrated that limiting operations to within the full ranges of proposed values of the parameters %NGP and T1 at the Willow Run Compressor Station would ensure compliance with the 91 ppbvd formaldehyde emissions standard. EPA therefore approves the petition for Unit 1 to operate between a T1 of 30.1-90.2 °F when the turbine is operating between 89.5-101.8% NGP, and in LPM. EPA denies the petition for all other ranges.

EPA would consider updating the ranges if DTE provides information showing that the formaldehyde standard is met at wider ranges of operating conditions.

We have coordinated this determination with the Office of Enforcement and Compliance Assurance (OECA) and the Office of Air Quality Planning and Standards (OAQPS). If you have any further questions, please contact Jacob Herbers of my staff at Herbers.Jacob@epa.gov.

Sincerely,

MICHAEL
HARRIS

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