



State of Ohio Environmental Protection Agency

Street Address:

Mailing Address:

Lazarus Gov. Center TELE: (614) 644-3020 FAX: (614) 644-2329

Lazarus Gov.
Center

**RE: DRAFT PERMIT TO INSTALL
KNOX COUNTY**

CERTIFIED MAIL

Application No: 01-08077

DATE: 2/2/00

Rolls Royce Energy Systems Inc
Louis Burcsak
105 N Sandusky St
Mt Vernon, OH 43050

You are hereby notified that the Ohio Environmental Protection Agency has made a draft action recommending that the Director issue a Permit to Install for the air contaminant source(s) [emissions unit(s)] shown on the enclosed draft permit. This draft action is not an authorization to begin construction or modification of your emissions unit(s). The purpose of this draft is to solicit public comments on the proposed installation. A public notice concerning the draft permit will appear in the Ohio EPA Weekly Review and the newspaper in the county where the facility will be located. Public comments will be accepted by the field office within 30 days of the date of publication in the newspaper. Any comments you have on the draft permit should be directed to the appropriate field office within the comment period. A copy of your comments should also be mailed to Robert Hodanbosi, Division of Air Pollution Control, Ohio EPA, P.O. Box 1049, Columbus, OH, 43266-0149.

A Permit to Install may be issued in proposed or final form based on the draft action, any written public comments received within 30 days of the public notice, or record of a public meeting if one is held. You will be notified in writing of a scheduled public meeting. Upon issuance of a final Permit to Install a fee of **\$1400** will be due. Please do not submit any payment now.

The Ohio EPA is urging companies to investigate pollution prevention and energy conservation. Not only will this reduce pollution and energy consumption, but it can also save you money. If you would like to learn ways you can save money while protecting the environment, please contact our Office of Pollution Prevention at (614) 644-3469. If you have any questions about this draft permit, please contact the field office where you submitted your application, or Mike Ahern, Field Operations & Permit Section at (614) 644-3631.

Very truly yours,

Thomas G. Rigo, Manager
Field Operations and Permit Section
Division of Air Pollution Control

CC: USEPA

CDO



STATE OF OHIO ENVIRONMENTAL PROTECTION AGENCY

**Permit To Install
Terms and
Conditions**

**Issue Date: To be entered upon final issuance
Effective Date: To be entered upon final issuance**

DRAFT PERMIT TO INSTALL 01-08077

Application Number: 01-08077
APS Premise Number: 0142010079
Permit Fee: **To be entered upon final issuance**
Name of Facility: Rolls Royce Energy Systems Inc
Person to Contact: Louis Burcsak
Address: 105 N Sandusky St
Mt Vernon, OH 43050

Location of proposed air contaminant source(s) [emissions unit(s)]:

**105 N Sandusky St
Mt Vernon, Ohio**

Description of proposed emissions unit(s):

Re-permitting 5 turbine, 1 turbine or reciprocating, and 1 reciprocating engine test stands after a facility buy-out; synthetic minor for Title V.

The above named entity is hereby granted a Permit to Install for the above described emissions unit(s) pursuant to Chapter 3745-31 of the Ohio Administrative Code. Issuance of this permit does not constitute expressed or implied approval or agreement that, if constructed or modified in accordance with the plans included in the application, the above described emissions unit(s) of environmental pollutants will operate in compliance with applicable State and Federal laws and regulations, and does not constitute expressed or implied assurance that if constructed or modified in accordance with those plans and specifications, the above described emissions unit(s) of pollutants will be granted the necessary permits to operate (air) or NPDES permits as applicable.

This permit is granted subject to the conditions attached hereto.

Ohio Environmental Protection Agency

Director

Part I - GENERAL TERMS AND CONDITIONS

A. Permit to Install General Terms and Conditions

1. Compliance Requirements

The emissions unit(s) identified in this Permit to Install shall remain in full compliance with all applicable State laws and regulations and the terms and conditions of this permit.

2. Reporting Requirements Related to Monitoring and Recordkeeping Requirements

The permittee shall submit required reports in the following manner:

- a. Reports of any required monitoring and/or recordkeeping information shall be submitted to the appropriate Ohio EPA District Office or local air agency.
- b. Except as otherwise may be provided in the terms and conditions for a specific emissions unit, quarterly written reports of (a) any deviations (excursions) from emission limitations, operational restrictions, and control device operating parameter limitations that have been detected by the testing, monitoring, and recordkeeping requirements specified in this permit, (b) the probable cause of such deviations, and (c) any corrective actions or preventive measures which have been or will be taken, shall be submitted to the appropriate Ohio EPA District Office or local air agency. If no deviations occurred during a calendar quarter, the permittee shall submit a quarterly report, which states that no deviations occurred during that quarter. The reports shall be submitted quarterly, i.e., by January 31, April 30, July 31, and October 31 of each year and shall cover the previous calendar quarters. (These quarterly reports shall exclude deviations resulting from malfunctions reported in accordance with OAC rule 3745-15-06.)

3. Records Retention Requirements

Each record of any monitoring data, testing data, and support information required pursuant to this permit shall be retained for a period of five years from the date the record was created. Support information shall include, but not be limited to, all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by this permit. Such records may be maintained in computerized form.

4. Inspections and Information Requests

The Director of the Ohio EPA, or an authorized representative of the Director, may, subject to the safety requirements of the permittee and without undue delay, enter upon the premises of this source at any reasonable time for purposes of making inspections, conducting tests, examining records or reports pertaining to any emission of air contaminants, and determining compliance with any applicable State air pollution laws and regulations and the terms and conditions of this permit. The permittee shall furnish to the Director of the Ohio EPA, or an authorized representative of the Director, upon receipt of a written request and within a reasonable time, any

information that may be requested to determine whether cause exists for modifying, reopening or revoking this permit or to determine compliance with this permit. Upon verbal or written request, the permittee shall also furnish to the Director of the Ohio EPA, or an authorized representative of the Director, copies of records required to be kept by this permit.

5. Scheduled Maintenance/Malfunction Reporting

Any scheduled maintenance of air pollution control equipment shall be performed in accordance with paragraph (A) of OAC rule 3745-15-06. The malfunction of any emissions units or any associated air pollution control system(s) shall be reported to the appropriate Ohio EPA District Office or local air agency in accordance with paragraph (B) of OAC rule 3745-15-06. Except as provided in that rule, any scheduled maintenance or malfunction necessitating the shutdown or bypassing of any air pollution control system(s) shall be accompanied by the shutdown of the emissions unit(s) that is (are) served by such control system(s).

6. Permit Transfers

Any transferee of this permit shall assume the responsibilities of the prior permit holder. The appropriate Ohio EPA District Office or local air agency must be notified in writing of any transfer of this permit.

7. Air Pollution Nuisance

The air contaminants emitted by the emissions units covered by this permit shall not cause a public nuisance, in violation of OAC rule 3745-15-07.

8. Termination of Permit to Install

This Permit to Install shall terminate within eighteen months of the effective date of the Permit to Install if the owner or operator has not undertaken a continuing program of installation or modification or has not entered into a binding contractual obligation to undertake and complete within a reasonable time a continuing program of installation or modification. This deadline may be extended by up to 12 months if application is made to the Director within a reasonable time before the termination date and the party shows good cause for any such extension.

9. Construction of New Sources(s)

The proposed emissions unit(s) shall be constructed in strict accordance with the plans and application submitted for this permit to the Director of the Ohio Environmental Protection Agency. There may be no deviation from the approved plans without the express, written approval of the Agency. Any deviations from the approved plans or the above conditions may

lead to such sanctions and penalties as provided under Ohio law. Approval of these plans does not constitute an assurance that the proposed facilities will operate in compliance with all Ohio laws and regulations. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed sources are inadequate or cannot meet applicable standards.

If the construction of the proposed emissions unit(s) has already begun or has been completed prior to the date the Director of the Environmental Protection Agency approves the permit application and plans, the approval does not constitute expressed or implied assurance that the proposed facility has been constructed in accordance with the approved plans. The action of beginning and/or completing construction prior to obtaining the Director's approval constitutes a violation of OAC rule 3745-31-02. Furthermore, issuance of the Permit to Install does not constitute an assurance that the proposed source will operate in compliance with all Ohio laws and regulations. Approval of the plans in any case is not to be construed as an approval of the facility as constructed and/or completed. Moreover, issuance of the Permit to Install is not to be construed as a waiver of any rights that the Ohio Environmental Protection Agency (or other persons) may have against the applicant for starting construction prior to the effective date of the permit. Additional facilities shall be installed upon orders of the Ohio Environmental Protection Agency if the proposed facilities prove to be inadequate or cannot meet applicable standards.

10. Public Disclosure

The facility is hereby notified that this permit, and all agency records concerning the operation of this permitted source, are subject to public disclosure in accordance with OAC rule 3745-49-03.

11. Applicability

This Permit to Install is applicable only to the emissions unit(s) identified in the Permit to Install. Separate application must be made to the Director for the installation or modification of any other emissions unit(s).

12. Best Available Technology

As specified in OAC Rule 3745-31-05, all new sources must employ Best Available Technology (BAT). Compliance with the terms and conditions of this permit will fulfill this requirement.

13. Source Operation and Operating Permit Requirements After Completion of Construction

This facility is permitted to operate each source described by this Permit to Install for a period of up to one year from the date the source commenced operation. This permission to operate is granted only if the facility complies with all requirements contained in this permit and all applicable air pollution laws, regulations, and policies. Pursuant to OAC Chapter 3745-35, the permittee shall submit a complete operating permit application within thirty (30) days after commencing operation of the emissions unit(s) covered by this permit.

14. Construction Compliance Certification

The applicant shall provide Ohio EPA with a written certification (see enclosed form) that the facility has been constructed in accordance with the Permit to Install application and the terms and conditions of the Permit to Install. The certification shall be provided to Ohio EPA upon completion of construction but prior to startup of the source.

15. Fees

The permittee shall pay fees to the Director of the Ohio EPA in accordance with ORC section 3745.11 and OAC Chapter 3745-78. The permittee shall pay all applicable Permit to Install fees within 30 days after the issuance of this Permit to Install.

B. Permit to Install Summary of Allowable Emissions

The following information summarizes the total allowable emissions, by pollutant, based on the individual allowable emissions of each air contaminant source identified in this permit.

**SUMMARY (for informational purposes only)
TOTAL PERMIT TO INSTALL ALLOWABLE EMISSIONS**

<u>Pollutant</u>	<u>Tons Per Year</u>
Facility Limits *N0x	
w/NG	86.91
w/jet fuel/kerosene	4.17
w/diesel	5.85
*CO w/NG	29.78
w/jet fuel/kerosene	0.14
w/diesel	1.56
*VOC w/NG	4.70
w/jet fuel/kerosene	0.06
w/diesel	2.17
*PM w/NG	3.14
w/jet fuel/kerosene	0.08
w/diesel	0.08
*S0x w/NG	0.11
w/jet fuel/kerosene	0.98
w/diesel	0.65

Limits are for all facility (7) test stands.

PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
Turbine/Compressor Test Stand (stack 115-S-01) using Natural Gas, Jet Fuel, Kerosene, or other Petroleum Distillate	OAC rule 3745-17-11(B)(4)
	OAC rule 3745-17-07(A)(1)
	OAC rule 3745-18-06(F)
	OAC rule 3745-18-06(A)
	OAC rule 3745-31-05(D)
	OAC rule 3745-31-05(A)(3)

Rolls

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To be entered upon final issuance

Emissions Unit ID: P001

40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines

<p>Applicable Emissions <u>Limitations/Control Measures</u></p>	<p>50.50 lbs CO/hr; 7.97 lbs VOC/hr; 5.32 lbs PM/hr; and 0.19 lbs SO₂/hr</p>
<p>Particulate emissions shall not exceed 0.040 pound per MMBtu of actual heat input</p>	<p>Hourly emissions from the combustion of jet fuel/kerosene/petroleum distillate in this emission unit shall not exceed the following limits:</p>
<p>Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule</p>	<p>568.81 lbs NO_x/hr; 18.61 lbs CO/hr; 7.97 lbs VOC/hr; 10.63 lbs PM/hr; and 132.90 lbs SO₂/hr</p>
<p>Sulfur dioxide (SO₂) emissions shall not exceed 0.5 pound per MMBtu of actual heat input, when using jet fuel, kerosene or other petroleum distillate, and see A.2.c</p>	<p>Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following limits:</p>
<p>Exempt from SO₂ limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet, and see A.2.c</p>	<p>86.91 tons NO_x per rolling 12 months; 29.78 tons CO per rolling 12 months; 4.70 tons VOC per rolling 12 months; 3.14 ton PM per rolling 12 months; and 0.11 ton SO₂ per rolling 12 months</p>
<p>Hourly emissions from the combustion of natural gas in this emissions unit shall not exceed the following limits:</p>	<p>Annual emissions from the combustion of jet fuel, kerosene, or other petroleum distillate in turbines installed in emissions units P001, P019, P020, and P028 shall not exceed the following limits:</p>
<p>287.06 lbs NO_x/hr with RB211 turbine; 29.24 lbs NO_x/hr with RB211 turbine with DLE; 122.27 lbs NO_x/hr with Avon or Allison turbine;</p>	<p>4.17 tons NO_x per rolling 12 months; 0.14 ton CO per rolling 12 months; 0.06 ton VOC per rolling 12 months;</p>

0.08 ton PM per rolling 12 months;
and
0.98 ton SO₂ per rolling 12 months

See Section B1 through B4, and
A.2.d

See Section A.2.a through A.2.c
below

2. Additional Terms and Conditions

- 2.a** Any stationary gas turbine used at this test stand with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (10 million Btu/hr) but less than or equal to 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0150 * (14.4)/Y + F$$

where:

STD=allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NO_x emission allowance for fuel-bound nitrogen.

N (below)=the nitrogen content of the fuel (percent by weight)

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NO_x percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.),

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NOx percent by volume (F) will equal $0.04(N)$.

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal $0.004 + 0.0067(N-0.1)$.

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

- 2.b** Any stationary gas turbine used at this test stand with a heat input at peak load greater than 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0075 * (14.4)/Y + F$$

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NOx emission allowance for fuel-bound nitrogen.

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NOx percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NOx percent by volume (F) will equal $0.04(N)$.

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal $0.004 + 0.0067(N-0.1)$.

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will

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equal to 0.005.

- 2.c** Any stationary gas turbine used at this test stand which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:
- i. emissions from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis; or
 - ii. fuel shall not contain sulfur in excess of 0.8 percent by weight
- 2.d** If any turbine other than the RB211, the RB211 with the dry-low-emission controls (DLE), the Avon turbine, or the Allison turbine are tested or operated at this test stand, emission testing shall be conducted to provide emission factors and show compliance with the limits contained in this permit as per Section E.10. Test data shows that NO_x emissions from

Emissions Unit ID: P001

natural gas vary with the size and type turbine used; emission factors used to calculate NO_x, CO, VOC, PM, and SO₂ emissions shall be maintained along with the record of fuel usage.

- 2.e The application and enforcement of the provisions of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60, are delegated to the Ohio Environmental Protection Agency. The requirements of 40 CFR Part 60 are also federally enforceable.

B. Operational Restrictions

1. This emissions unit shall only be fired with natural gas, jet fuel, kerosene, or other petroleum distillate oil.
2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months; and

Annual jet fuel, kerosene, and other petroleum distillate usage in turbines assembled at emissions units P001, P019, and P020, and P028 shall not exceed 30,000 gallons per rolling 12-months.

3. The quality of the jet fuel, kerosene, or other petroleum distillate burned in this emissions unit shall meet the following specifications on an "as received" basis:
 - a. a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound sulfur dioxide/MMBtu actual heat input, unless a lower limit is required per 40 CFR 60, Subpart GG; and,
 - b. greater than 130,000 Btu/gallon of oil.

Compliance with the above-mentioned specifications shall be determined by using monitoring and testing methods described in Sections C and E of this permit.

4. To ensure enforceability during the first 12 calendar months of operation, the fuel usage in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 and all turbines burning distillate fuels, including emissions units P001, P019, P020, and P028 shall not exceed the following fuel usage limits, as specified in the following table:

Month	Natural Gas (ft ³)	Distillate fuels (gal) jet fuel/kerosene/other
1	27,500,000	2,500
2	55,000,000	5,000

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3	82,500,000	7,500
4	110,000,000	10,000
5	137,500,000	12,500
6	165,000,000	15,000
7	192,500,000	17,500
8	220,000,000	20,000
9	247,500,000	22,500
10	275,000,000	25,000
11	302,500,000	27,500
12	330,000,000	30,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas and jet fuel/kerosene/petroleum distillate usage for each turbine/compressor unit tested at this test stand during periods of operation. Records of fuel usage shall be maintained for each turbine/compressor unit installed at the test stand, per Section C.3 below.
2. The facility shall maintain a record of the company identification of each turbine installed at this test stand, which would reference the turbine size based on the heat input needed at peak load in MMBtu per hour and/or gigajoules per hour, the type of turbine and the manufacturer, and the date each turbine was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emission units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type fuel used.
4. The permittee shall collect or require the oil supplier to collect a representative grab sample for each shipment of petroleum distillates received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analysis for sulfur content and heat content in accordance with the following ASTM methods: ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and ASTM method D240 for heat content. Alternative, equivalent methods may be used upon written approval by the Ohio EPA Central District Office. For each shipment of oil

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PTI *A*

Emissions Unit ID: P001

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received for burning in this emissions unit, the permittee shall maintain records of the type of distillate, the total quantity received, and the permittee's or oil supplier's analysis for sulfur content and heat content.

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5. With each shipment of petroleum distillate oil received (jet fuel, kerosene, and any other petroleum distillate), or with any change in the quality of natural gas received at the facility, the representative sulfur dioxide emission rate from turbine fuels shall be calculated as specified in OAC rule 3745-18-04(F):

- a. each shipment of petroleum distillate oil received shall be tested for the sulfur content and heat content or the oil supplier's analysis shall be provided, and the records of testing results maintained, per Section C.4. Until stack testing is conducted, as per Section E.10, the SO₂ per MMBtu emissions shall be determined per OAC rule 3745-18-04(F)(2);
- b. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and,
- c. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined per OAC rule 3745-18-04(F)(3).

6. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall monitor the sulfur content and nitrogen content of the fuel being fired, as required by 40 CFR 60, Subpart GG as follows:

- a. if the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source; or,
- b. if the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily, or if substantiated with the appropriate data and if approved by the Administrator, fuel vendors may develop custom schedules for determination of maximum sulfur and nitrogen content based on the design and operation of the source and the characteristics of the fuel supply; and,
- c. results of the fuel analysis, taken after each new shipment of oil is received, shall be used as the daily value when calculating the 30-day rolling average until the next shipment is received.

D. Reporting Requirements

1. If a petroleum distillate oil is used in this emissions unit, the permittee shall submit, on a quarterly basis, copies of the permittee's or oil supplier's analysis for each shipment of oil which is received. The permittee's or oil supplier's analysis shall document the sulfur content (percent) and heat

To be entered upon final issuance

content (Btu/gallon) for each shipment of oil. The following information shall also be included with the copies of the permittee's or oil supplier's analysis:

- a. the total quantity of jet fuel, kerosene, and/or other petroleum distillate received in each shipment (gallons);
- b. the weighted* average sulfur dioxide emission rate (pounds/MMBtu) for the jet fuel, kerosene, and/or other petroleum distillate received during the calendar month; and,
- c. the weighted* average heat content (Btu/gallon) of the jet fuel, kerosene, and/or petroleum distillate received during the calendar month.

These quarterly reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the oil shipments received and fuel used during the previous calendar quarters. If petroleum distillate oils are not used during the quarter, no report shall be required.

- * In proportion to the quantity of jet fuel/kerosene/petroleum distillate received in each shipment during the month

2. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.4. These reports are due by the date described in Part 1 - General Terms and Conditions of this permit under Section A.2.

3. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall submit quarterly reports, as required by 40 CFR 60, Subpart GG, to the Ohio EPA Central District Office. The following information shall also be included in this report:

- a. any period of time during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during any performance test; and,
- b. any period of time during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent by weight or emissions of sulfur dioxide exceed 0.015 percent by volume at 15 percent oxygen on a dry basis.

These quarterly emissions reports (only required if a turbine is in operation 60 days from the first testing date) shall include the average fuel consumption, ambient conditions, gas turbine load, the sulfur and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures used to compute the emissions, and shall be postmarked by the 30th day following the end

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To be

Facility ID: 0142010079

Emissions Unit ID: P001

of each calendar quarter.

4. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.

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Emissions Unit ID: P001

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5. Pursuant to the NSPS, the source owner/operator is hereby advised of the requirement to report the following at the appropriate times:

- a. construction date (no later than 30 days after such date);
- b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);
- c. actual start-up date (within 15 days after such date); and,
- d. date of performance testing (if required, at least 30 days prior to testing).

Reports shall include reference to the company identification of the turbine, the unit or serial number, and are to be sent to:

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P. O. Box 163669
Columbus, Ohio 43216-3669

and

Central District Office
3232 Alum Creek Drive
Columbus, Ohio 43207-3417

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with the following methods:

1. Emission Limitation

0.040 pound PM per million Btu of actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1, or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

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Pollutant	Emission Factor	Source of Factor
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
PM w/ oil distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1

2. Emission limitation

0.5 lb SO₂/MM Btu actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by testing the sulfur content and heat content of each shipment of petroleum distillates received and maintaining records of these testing results or the oil supplier's analysis, per Section C.4. Until stack testing is conducted, as per Section E.10, the SO₂ per MMBtu emissions shall be calculated per OAC rule 3745-18-04(F)(2) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.974$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the liquid fuel in Btu per gallon

D = the density of the liquid fuel in pounds per gallon; and

S = the decimal fraction of sulfur in the liquid fuel

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

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3. SO2 limitations contained in 40 CFR 60, Subpart GG
 - a. fuel shall not contain sulfur in excess of 0.8 percent by weight; or
 - b. gases discharged from this emissions unit shall not contain SO2 in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis.

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Applicable Compliance Method

Compliance with the fuel bound sulfur concentration and/or sulfur emissions limitation contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand.

- a. Fuel testing shall be conducted to demonstrate compliance with the allowable sulfur content and shall be determined as follows:

ASTM D2880 shall be used to determine the sulfur content of liquid fuels.

ASTM D1072, D3031, D4084, or D3246 shall be used to determine the sulfur content of gaseous fuels, as referenced in 40 CFR Part 60.335(d).

The fuel analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency. The method and date of testing must be recorded along with the results.

- b. Emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 6 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the sulfur dioxide concentration limits contained in Subpart GG.

4. NOx limitations contained in 40 CFR 60, Subpart GG

- a. $\text{NO}_x \text{ \{STD\}} = 0.0150 * (14.4)/Y + F$ if peak load greater than 10 MM Btu/hr., and less than 100 MM Btu/hr, and

- b. $\text{NO}_x \text{ \{STD\}} = 0.0075 * (14.4)/Y + F$ if peak load greater than 100 MM Btu/hr

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis)
Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour

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F=NOx emission allowance for fuel-bound nitrogen

Applicable Compliance Method

Compliance with the nitrogen oxide emission limitations contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand. The emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 7 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the nitrogen oxide emissions and oxygen concentration limits contained in Subpart GG. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NOx emissions shall be determined at each of 4 load conditions of 30, 50, 75, and 100 percent of peak load or at 4 points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. The nitrogen oxides emission rate shall be computed for each run using the equation found in 40 CFR 60.335(c)(1).

5. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

6. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012

86.91 tons NOx per rolling 12 months;
29.78 tons CO per rolling 12 months;
4.70 tons VOC per rolling 12 months;
3.14 ton PM per rolling 12 months; and
0.11 ton SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2-2 dated 10/96, or other factors derived from testing and approved by the Ohio EPA Central District Office:

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.03 lb/MM Bt	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

Reciprocating Engines (P028 or P012):

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SO2 w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

*DLE= "Dry Low Emission"-new control technology

7. Rolling 12-month emission limitations when burning jet fuel, kerosene, and/or other petroleum distillate oils in all turbines using these fuels (P001, P019, P020, and P028)

4.17 tons NOx per rolling 12 months;

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0.14 ton CO per rolling 12 months;
0.06 ton VOC per rolling 12 months;
0.08 ton PM per rolling 12 months; and
0.98 ton SO₂ per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of jet fuel, kerosene, and/or other petroleum distillate in turbine/compressor test stand emissions units P001, P019, P020, and P028 shall be demonstrated through the monthly recordkeeping of the fuels consumed in these emissions units and adding the rolling 12-month total jet fuel, kerosene, and/or other petroleum distillate usage each month. Emissions shall be calculated using the following worst case emission

factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NO _x w/distillates	2.14 lb/MM Btu	Facility Testing Results
CO w/distillates	0.07 lb/MM Btu	Facility Testing Results
VOC w/distillates	0.03 lb/MM Btu	Facility Testing Results
PM w/distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1
SO _x w/distillates	0.50 lb/MM Btu until testing	Limit from 3745-18-06(F)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

8. Hourly emission limits when using natural gas

287.06 lbs NO_x/hr with RB211 turbine;
29.24 lbs NO_x/hr with RB211 with DLE turbine;
122.27 lbs NO_x/hr with Avon or Allison turbine;
50.50 lbs CO/hr;
7.97 lbs VOC/hr;
5.32 lbs PM/hr; and
0.19 lb SO₂/hr

Applicable Compliance Method

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Until testing is completed, compliance with the hourly emission limits from the combustion of natural gas in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96 or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu E.10)	Facility Testing Results (see Section
NOx w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu E.10)	Facility Testing Results (see Section
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu E.10)	Facility Testing Results (see Section
CO w/ natural gas	0.19 lb/MM Btu E.10)	Facility Testing Results (see Section
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

* DLE="Dry Low Emission"-new control technology

9. Hourly emission limits when using jet fuel, kerosene, or other petroleum distillate

568.81 lbs NOx/hr;
18.61 lbs CO/hr;
7.97 lbs VOC/hr;
10.63 lbs PM/hr; and
132.90 lbs SO2/hr

Applicable Compliance Method

Until testing has been conducted, compliance with the hourly emissions from the combustion of jet fuel, kerosene, or other petroleum distillate in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural

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gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96 or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NOx w/ fuel oil	2.14 lb/MM Btu	Facility Testing Results (see
	Section E.10)	
CO w/ fuel oil	0.07 lb/MM Btu	Facility Testing
	Results (see Section E.10)	
VOC w/ fuel oil	0.03 lb/MM Btu	Facility Testing Results
PM w/ fuel oil	0.04 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ fuel oil	0.50 lb/MM Btu	Limit from 3745-18-06(F)
	until testing (see Section C.4 and Section E.10)	

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

10. Emission limits

287.06 lbs NOx/hr with RB211 turbine when using natural gas;
29.24 lbs NOx/hr with RB211 turbine with DLE when using natural gas;
122.27 lbs NOx/hr with Avon or Allison turbine when using natural gas;
50.50 lbs CO/hr when using natural gas;
568.81 lbs NOx/hr when using jet fuel/kerosene/petroleum distillate;
18.61 lbs CO/hr when using jet fuel/kerosene/petroleum distillate; and
132.90 lbs SO2/hr when using jet fuel/kerosene/petroleum distillate

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- a. emission testing for the combustion of natural gas shall be conducted one time during the term of this permit on one of each type of turbine and within 6 months after issuance of the permit, or when installed if any one of the turbine types are not installed within this time frame, and if at any time, jet fuel, kerosene, and/ or other petroleum distillate is to be used in P001, P019, P020, or P028 the permittee shall conduct, or have conducted, at the time of use or within 2 months of the use of this fuel, emission testing for one test turbine, to represent emissions of all

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test turbines burning jet fuel, kerosene, and/or other petroleum distillate;

b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide when using either fuel type and, in addition, sulfur oxides when using jet fuel, kerosene, or other petroleum distillate;

c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 20, Method 10, and Method 9

Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.

d. the tests shall be conducted for each turbine type using natural gas (RB211, RB211 with DLE, and a Avon or Allison) installed at any one of the emissions units represented in the rolling 12-month limits of this permit (P001, P004, P019, P020, P023, and P028), and as per Section E.10.a for jet fuel or kerosene;

e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;

f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;

g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and,

h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request

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additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

This Permit to Install (01-8077) replaces Permit to Install 01-4996, in the name of Cooper Energy Services, for this emissions unit.

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PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
Compressor Test Stand (stack 87-S-09) using Natural Gas	OAC rule 3745-17-11(B)(4)	OAC rule 3745-31-05(D)
	OAC rule 3745-17-07(A)(1)	
	OAC rule 3745-18-06(F)	
	OAC rule 3745-18-06(A)	40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines
	OAC rule 3745-31-05(A)(3)	

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Applicable Emissions	not exceed the following limits:
<u>Limitations/Control Measures</u>	86.91 tons NOx per rolling 12 months;
Particulate emissions shall not exceed 0.040 pound per MMBtu of actual heat input	29.78 tons CO per rolling 12 months;
Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule	4.70 tons VOC per rolling 12 months;
Sulfur dioxide emissions shall not exceed 0.5 pound per MMBtu of actual heat input	3.14 ton PM per rolling 12 months; and 0.11 ton SO2 per rolling 12 months
Exempt from SO2 limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet	See Sections B1 through B3, and A.2
Hourly emissions from the combustion of natural gas in this emissions unit shall not exceed the following limits:	This turbine was manufactured prior to 10/3/77 and is exempt from this subpart
122.27 lbs NOx/hr;	
50.50 lbs CO/hr;	
7.97 lbs VOC/hr;	
5.32 lbs PM/hr; and	
0.19 lb SO2/hr	
Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall	

2. Additional Terms and Conditions

- 2.a If the Avon turbine is replaced at this test stand a new Permit to Install shall be required prior to installation.

B. Operational Restrictions

1. This emissions unit shall only be fired with natural gas. The turbine installed at this test stand was manufactured in the 1960's and is exempt from 40 CFR 60 Subpart GG; this turbine cannot be changed-out and/or replaced with another without applying for a Permit to Install for the inclusion of these requirements.
2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months.
3. To ensure enforceability during the first 12 calendar months of operation, the fuel usage from all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following natural gas usage limits, as specified in the following table:

Month	Natural Gas (ft3)
1	27,500,000
2	55,000,000
3	82,500,000
4	110,000,000
5	137,500,000
6	165,000,000
7	192,500,000
8	220,000,000
9	247,500,000
10	275,000,000
11	302,500,000
12	330,000,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas usage for each compressor unit tested at

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this test stand during periods of operation. Records of fuel usage shall be maintained for each compressor unit installed at the test stand, per Section C.3 below.

2. The facility shall maintain a record of the date each compressor was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emission units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and/or reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type of fuel used.
4. The representative sulfur dioxide emission rate from the natural gas used in this emissions unit shall be calculated as specified in OAC rule 3745-18-04(F):
 - a. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pounds of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and,
 - b. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined per OAC rule 3745-18-04(F)(3).

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D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.3. These reports are due by the date described in Part 1 - General Terms and Conditions of this permit under Section A.2.

2. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with the following methods:

1. Emission Limitation

0.040 pound PM per million Btu of actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1, or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

Pollutant	Emission Factor	Source of Factor
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1

2. Emission limitation

0.5 lb SO₂/mm Btu actual heat input

Applicable Compliance Method

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

3. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

4. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012

86.91 tons NO_x per rolling 12 months;

29.78 tons CO per rolling 12 months;

4.70 tons VOC per rolling 12 months;

3.14 ton PM per rolling 12 months; and

0.11 ton SO₂ per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air

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Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2.2 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using RB211 turbine w/DLE*	0.11 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

Reciprocating Engines (P028 or P012):

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SO2 w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

*DLE="Dry Low Emission"-new control technology

5. Hourly emission limits when using natural gas in the Avon turbine

122.27 lbs NOx/hr;
50.50 lbs CO/hr;
7.97 lbs VOC/hr;
5.32 lbs PM/hr; and
0.19 lb SO2/hr

Applicable Compliance Method

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Until testing is completed, compliance with the hourly emission limits from the combustion of natural gas from the turbine, in the testing of any compressor installed at this test stand, shall be demonstrated through the calculation of emissions from the combustion of natural gas in the turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas w/Avon turbine	0.46 lb/MM Btu Section E.6)	Facility Testing Results (see
CO w/ natural gas	0.19 lb/MM Btu Section E.6)	Facility Testing Results (see
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

6. Emission limits

122.27 lbs NOx/hr using natural gas with Avon turbine;
50.50 lbs CO/hr using natural gas;

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- a. the emission testing shall be conducted one time during the term of this permit and within 6 months after issuance of the permit;
- b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide;
- c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 20, Method 10, and Method

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Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.

- d. the tests shall be conducted at this test stand or by testing any turbine of equal size (an Avon or Allison turbine), that is installed and operating at the time testing is scheduled, and at any one of the emissions units represented in the rolling 12-month limits of this permit (P001, P004, P019, P020, P023, and P028);
- e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;
- f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;

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g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and,

h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

This Permit to Install (01-8077) replaces Permit to Install 01-4996, in the name of Cooper Energy Services, for this emissions unit.

PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
Turbine/Compressor Test Stand (stack 87-S-06) using Natural Gas, Jet Fuel, Kerosene, or other Petroleum Distillate	OAC rule 3745-17-11(B)(4)	
	OAC rule 3745-17-07(A)(1)	
	OAC rule 3745-18-06(F)	
	OAC rule 3745-18-06(A)	OAC rule 3745-31-05(D)
	OAC rule 3745-31-05(A)(3)	

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	<u>Applicable Emissions Limitations/Control Measures</u>	7.97 lbs VOC/hr; 5.32 lbs PM/hr; and 0.19 lb SO ₂ /hr
	Particulate emissions shall not exceed 0.040 pound per MMBtu of actual heat input Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule	Hourly emissions from the combustion of jet fuel/kerosene/petroleum distillate in this emission unit shall not exceed the following limits: 568.81 lbs NO _x /hr; 18.61 lbs CO/hr; 7.97 lbs VOC/hr; 10.63 lbs PM/hr; and 132.90 lbs SO ₂ /hr
40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines	Sulfur dioxide (SO ₂) emissions shall not exceed 0.5 pound per MMBtu of actual heat input, when using jet fuel, kerosene or other petroleum distillate, and see A.2.c Exempt from SO ₂ limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet, and see A.2.c	Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following limits: 86.91 tons NO _x per rolling 12 months; 29.78 tons CO per rolling 12 months; 4.70 tons VOC per rolling 12 months; 3.14 ton PM per rolling 12 months; and 0.11 ton SO ₂ per rolling 12 months
	Hourly emissions from the combustion of natural gas in this emissions unit shall not exceed the following limits: 287.06 lbs NO _x /hr with RB211 turbine; 29.24 lbs NO _x /hr with RB211 turbine with DLE; 122.27 lbs NO _x /hr with Avon or Allison turbine; 50.50 lbs CO/hr;	Annual emissions from the combustion of jet fuel, kerosene, or other petroleum distillate in turbines installed in emissions units P001, P019, P020, and P028 shall not exceed the following limits: 4.17 tons NO _x per rolling 12 months; 0.14 ton CO per rolling 12 months; 0.06 ton VOC per rolling 12 months; 0.08 ton PM per rolling 12 months;

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and

0.98 ton SO₂ per rolling 12 months

See Section B1 through B4, and
A.2.d

See Section A.2.a through A.2.c
below

2. Additional Terms and Conditions

- 2.a** Any stationary gas turbine used at this test stand with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (10 million Btu/hr) but less than or equal to 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0150 * (14.4)/Y + F$$

where:

STD=allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NO_x emission allowance for fuel-bound nitrogen.

N (below)=the nitrogen content of the fuel (percent by weight)

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NO_x percent by volume (F) will equal zero.

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If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NOx percent by volume (F) will equal $0.04(N)$.

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal $0.004 + 0.0067(N-0.1)$.

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

- 2.b** Any stationary gas turbine used at this test stand with a heat input at peak load greater than 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0075 * (14.4)/Y + F$$

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NOx emission allowance for fuel-bound nitrogen.

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NOx percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NOx percent by volume (F) will equal $0.04(N)$.

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal $0.004 + 0.0067(N-0.1)$.

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

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- 2.c** Any stationary gas turbine used at this test stand which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:
- i. emissions from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis; or
 - ii. fuel shall not contain sulfur in excess of 0.8 percent by weight
- 2.d** If any turbine other than the RB211, the RB211 with the dry-low-emission controls (DLE), the Avon turbine, or the Allison turbine are tested or operated at this test stand, emission testing shall be conducted to provide emission factors and show compliance with the limits contained in this permit as per Section E.10. Test data shows that NO_x emissions from natural gas vary with the size and type turbine used; emission factors used to calculate NO_x, CO, VOC, PM, and SO₂ emissions shall be maintained along with the record of fuel usage.
- 2.e** The application and enforcement of the provisions of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60, are delegated to the Ohio Environmental Protection Agency. The requirements of 40 CFR Part 60 are also federally enforceable.

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B. Operational Restrictions

1. This emissions unit shall only be fired with natural gas, jet fuel, kerosene, or other petroleum distillate oil.
2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months; and

Annual jet fuel, kerosene, and other petroleum distillate usage in turbines assembled at emissions units P001, P019, P020, and P028 shall not exceed 30,000 gallons per rolling 12-months.

3. The quality of the jet fuel, kerosene, or other petroleum distillate burned in this emissions unit shall meet the following specifications on an "as received" basis:

- a. a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound sulfur dioxide/MMBtu actual heat input, unless a lower limit is required per 40 CFR 60, Subpart GG; and,
- b. greater than 130,000 Btu/gallon of oil.

Compliance with the above-mentioned specifications shall be determined by using monitoring and testing methods described in Sections C and E of this permit.

4. To ensure enforceability during the first 12 calendar months of operation, the fuel usage in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 and all turbines burning distillate fuels, including emissions units P001, P019, P020, and P028 shall not exceed the following fuel usage limits, as specified in the following table:

Month	Natural Gas (ft3)	Distillate fuels (gal) jet fuel/kerosene/other
1	27,500,000	2,500
2	55,000,000	5,000
3	82,500,000	7,500
4	110,000,000	10,000
5	137,500,000	12,500
6	165,000,000	15,000
7	192,500,000	17,500
8	220,000,000	20,000
9	247,500,000	22,500

10	275,000,000	25,000
11	302,500,000	27,500
12	330,000,000	30,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas and jet fuel/kerosene/petroleum distillate usage for each turbine/compressor unit tested at this test stand during periods of operation. Records of fuel usage shall be maintained for each turbine/compressor unit installed at the test stand, per Section C.3 below.
2. The facility shall maintain a record of the company identification of each turbine installed at this test stand, which would reference the turbine size based on the heat input needed at peak load in MMBtu per hour and/or gigajoules per hour, the type of turbine and the manufacturer, and the date each turbine was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emission units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and/or reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type of fuel used.
4. The permittee shall collect or require the oil supplier to collect a representative grab sample for each shipment of petroleum distillates received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analysis for sulfur content and heat content in accordance with the following ASTM methods: ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and ASTM method D240 for heat content. Alternative, equivalent methods may be used upon written approval by the Ohio EPA Central District Office. For each shipment of oil received for burning in this emissions unit, the permittee shall maintain records of the type of distillate, the total quantity received, and the permittee's or oil supplier's analysis for sulfur content and heat content.
5. With each shipment of petroleum distillate oil received (jet fuel, kerosene, and any other petroleum distillate), or with any change in the quality of natural gas received at the facility, the representative sulfur dioxide emission rate from turbine fuels shall be calculated as specified in OAC rule

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3745-18-04(F):

- a. each shipment of petroleum distillate oil received shall be tested for the sulfur content and heat content or the oil supplier's analysis shall be provided, and the records of testing results maintained, per Section C.4. Until stack testing is conducted, as per Section E.10, the SO₂ per MMBtu emissions shall be determined per OAC rule 3745-18-04(F)(2);

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- b. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and,
 - c. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined per OAC rule 3745-18-04(F)(3).
6. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall monitor the sulfur content and nitrogen content of the fuel being fired, as required by 40 CFR 60, Subpart GG as follows:
- a. if the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source; or,
 - b. if the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily, or if substantiated with the appropriate data and if approved by the Administrator, fuel vendors may develop custom schedules for determination of maximum sulfur and nitrogen content based on the design and operation of the source and the characteristics of the fuel supply; and,
 - c. results of the fuel analysis, taken after each new shipment of oil is received, shall be used as the daily value when calculating the 30-day rolling average until the next shipment is received.

D. Reporting Requirements

1. If a petroleum distillate oil is used in this emissions unit, the permittee shall submit, on a quarterly basis, copies of the permittee's or oil supplier's analysis for each shipment of oil which is received. The permittee's or oil supplier's analysis shall document the sulfur content (percent) and heat content (Btu/gallon) for each shipment of oil. The following information shall also be included with the copies of the permittee's or oil supplier's analysis:
 - a. the total quantity of jet fuel, kerosene, and/or other petroleum distillate received in each shipment (gallons);
 - b. the weighted* average sulfur dioxide emission rate (pounds/MMBtu) for the jet fuel, kerosene, and/or other petroleum distillate received during the calendar month; and,

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- c. the weighted* average heat content (Btu/gallon) of the jet fuel, kerosene, and/or petroleum distillate received during the calendar month.

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These quarterly reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the oil shipments received and fuel used during the previous calendar quarters. If petroleum distillate oils are not used during the quarter, no report shall be required.

* In proportion to the quantity of jet fuel/kerosene/petroleum distillate received in each shipment during the month

2. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.4. These reports are due by the date described in Part 1 - General Terms and Conditions of this permit under Section A.2.

3. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall submit quarterly reports, as required by 40 CFR 60, Subpart GG, to the Ohio EPA Central District Office. The following information shall also be included in this report:

- a. any period of time during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during any performance test; and,
- b. any period of time during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent by weight or emissions of sulfur dioxide exceed 0.015 percent by volume at 15 percent oxygen on a dry basis.

These quarterly emissions reports (only required if a turbine is in operation 60 days from the first testing date) shall include the average fuel consumption, ambient conditions, gas turbine load, the sulfur and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures used to compute the emissions, and shall be postmarked by the 30th day following the end of each calendar quarter.

4. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.

5. Pursuant to the NSPS, the source owner/operator is hereby advised of the requirement to report the following at the appropriate times:

- a. construction date (no later than 30 days after such date);

- b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);
- c. actual start-up date (within 15 days after such date); and,
- d. date of performance testing (if required, at least 30 days prior to testing).

Reports shall include reference to the company identification of the turbine, the unit or serial number, and are to be sent to:

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P. O. Box 163669
Columbus, Ohio 43216-3669

and

Central District Office
3232 Alum Creek Drive
Columbus, Ohio 43207-3417

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with the following methods:

1. Emission Limitation

0.040 pound PM per million Btu of actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1, or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

Pollutant	Emission Factor	Source of Factor
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
PM w/ oil distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1

2. Emission limitation

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0.5 lb SO₂/MM Btu actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by testing the sulfur content and heat content of each shipment of petroleum distillates received and maintaining records of these testing results or the oil supplier's analysis, per Section C.4. Until stack testing is conducted, as per Section E.10, the SO₂ per MMBtu emissions shall be calculated per OAC rule 3745-18-04(F)(2) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.974$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the liquid fuel in Btu per gallon

D = the density of the liquid fuel in pounds per gallon; and

S = the decimal fraction of sulfur in the liquid fuel

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

3. SO₂ limitations contained in 40 CFR 60, Subpart GG

a. fuel shall not contain sulfur in excess of 0.8 percent by weight; or,

b. gases discharged from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis.

Applicable Compliance Method

Compliance with the fuel bound sulfur concentration and/or sulfur emissions limitation contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand.

- a. Fuel testing shall be conducted to demonstrate compliance with the allowable sulfur content and shall be determined as follows:

ASTM D2880 shall be used to determine the sulfur content of liquid fuels.

ASTM D1072, D3031, D4084, or D3246 shall be used to determine the sulfur content of gaseous fuels, as referenced in 40 CFR Part 60.335(d).

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The fuel analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency. The method and date of testing must be recorded along with the results.

- b. Emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 6 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the sulfur dioxide concentration limits contained in Subpart GG.

4. NOx limitations contained in 40 CFR 60, Subpart GG

- a. $\text{NOx } \{\text{STD}\} = 0.0150 * (14.4)/Y + F$ if peak load greater than 10 MM Btu/hr., and less than 100 MM Btu/hr, and

- b. $\text{NOx } \{\text{STD}\} = 0.0075 * (14.4)/Y + F$ if peak load greater than 100 MM Btu/hr

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis)

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour

F=NOx emission allowance for fuel-bound nitrogen

Applicable Compliance Method

Compliance with the nitrogen oxide emission limitations contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand. The emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 7 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the nitrogen oxide emissions and oxygen concentration limits contained in Subpart GG. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NOx emissions shall be determined at each of

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4 load conditions of 30, 50, 75, and 100 percent of peak load or at 4 points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. The nitrogen oxides emission rate shall be computed for each run using the equation found in 40 CFR 60.335(c)(1).

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5. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

6. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012

86.91 tons NOx per rolling 12 months;
29.78 tons CO per rolling 12 months;
4.70 tons VOC per rolling 12 months;
3.14 ton PM per rolling 12 months; and
0.11 ton SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2-2 dated 10/96, or other factors derived from testing and approved by the Ohio EPA Central District Office:

Turbine:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results

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CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.03 lb/MM Bt	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Bt	AP-42 Table 3.1-1

Reciprocating Engines (P028 or P012):

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SO2 w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

*DLE= "Dry Low Emission"-new control technology

7. Rolling 12-month emission limitations when burning jet fuel, kerosene, and/or other petroleum distillate oils in all turbines using these fuels (P001, P019, P020, and P028)

- 4.17 tons NOx per rolling 12 months;
- 0.14 ton CO per rolling 12 months;
- 0.06 ton VOC per rolling 12 months;
- 0.08 ton PM per rolling 12 months; and
- 0.98 ton SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of jet fuel, kerosene, and/or other petroleum distillate in turbine/compressor test stand emissions units P001, P019, P020, and P028 shall be demonstrated through the monthly recordkeeping of the fuels consumed in these emissions units and adding the rolling 12-month total jet fuel, kerosene, and/or other petroleum distillate usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NOx w/distillates	2.14 lb/MM Btu	Facility Testing Results
CO w/distillates	0.07 lb/MM Btu	Facility Testing Results

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VOC w/distillates

0.03 lb/MM Btu

Facility Testing Results

PM w/distillates

0.04 lb/MM Btu

AP-42 Table 3.1-1

SOX w/distillates

0.50 lb/MM Btu

Limit from 3745-18-06(F)

until testing

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

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8. Hourly emission limits when using natural gas

287.06 lbs NO_x/hr with RB211 turbine;
29.24 lbs NO_x/hr with RB211 with DLE turbine;
122.27 lbs NO_x/hr with Avon or Allison turbine;
50.50 lbs CO/hr;
7.97 lbs VOC/hr;
5.32 lbs PM/hr; and
0.19 lb SO₂/hr

Applicable Compliance Method

Until testing is completed, compliance with the hourly emission limits from the combustion of natural gas in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96 or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NO _x w/ natural gas using RB211 turbine	1.08 lb/MM Btu E.10)	Facility Testing Results (see Section
NO _x w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu E.10)	Facility Testing Results (see Section
NO _x w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu E.10)	Facility Testing Results (see Section
CO w/ natural gas	0.19 lb/MM Btu E.10)	Facility Testing Results (see Section
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

* DLE="Dry Low Emission"-new control technology

9. Hourly emission limits when using jet fuel, kerosene, or other petroleum distillate

568.81 lbs NO_x/hr;
18.61 lbs CO/hr;
7.97 lbs VOC/hr;
10.63 lbs PM/hr; and
132.90 lbs SO₂/hr

Applicable Compliance Method

Until testing has been conducted, compliance with the hourly emissions from the combustion of jet fuel, kerosene, or other petroleum distillate in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96 or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NO _x w/ fuel oil	2.14 lb/MM Btu	Facility Testing Results (see Section E.10)
CO w/ fuel oil	0.07 lb/MM Btu	Facility Testing Results (see Section E.10)
VOC w/ fuel oil	0.03 lb/MM Btu	Facility Testing Results
PM w/ fuel oil	0.04 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ fuel oil	0.50 lb/MM Btu	Limit from 3745-18-06(F) until testing (see Section C.4 and Section E.10)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

10. Emission limits

287.06 lbs NO_x/hr with RB211 turbine when using natural gas;
29.24 lbs NO_x/hr with RB211 turbine with DLE when using natural gas;
122.27 lbs NO_x/hr with Avon or Allison turbine when using natural gas;
50.50 lbs CO/hr when using natural gas;
568.81 lbs NO_x/hr when using jet fuel/kerosene/petroleum distillate;
18.61 lbs CO/hr when using jet fuel/kerosene/petroleum distillate; and
132.90 lbs SO₂/hr when using jet fuel/kerosene/petroleum distillate

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

a. emission testing for the combustion of natural gas shall be conducted one time during the term of this permit on one of each type of turbine and within 6 months after issuance of the permit, or when installed if any one of the turbine types are not installed within this time frame; and if at any time, jet fuel, kerosene, and/ or other petroleum distillate is to be used in P001, P019, P020, or P028 the permittee shall conduct, or have conducted, at the time of use or within 2 months of the use of this fuel, emission testing for one test turbine, to represent emissions of all test turbines burning jet fuel, kerosene, and/or other petroleum distillate;

b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide when using either fuel type and, in addition, sulfur oxides when using jet fuel, kerosene, or other petroleum distillate;

c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 20, Method 10, and Method 9

Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.

d. the tests shall be conducted for each turbine type using natural gas (RB211, RB211 with DLE, and a Avon or Allison) installed at any one of the emissions units represented in the rolling 12-month limits of this permit (P001, P004, P019, P020, P023, and P028), and as per Section E.10.a for distillates;

e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;

f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests

may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;

- g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and,
- h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

This Permit to Install (01-8077) replaces Permit to Install 01-4996, in the name of Cooper Energy Services, for this emissions unit.

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PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
Turbine/Compressor Test Stand (stack 87-S-07) using Natural Gas, Jet Fuel, Kerosene, or other Petroleum Distillate	OAC rule 3745-17-11(B)(4)
	OAC rule 3745-17-07(A)(1)
	OAC rule 3745-18-06(F)
	OAC rule 3745-18-06(A)
	OAC rule 3745-31-05(D)
	OAC rule 3745-31-05(A)(3)

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40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines

Applicable Emissions Limitations/Control Measures	7.97 lbs VOC/hr; 5.32 lbs PM/hr; and 0.19 lb SO ₂ /hr
Particulate emissions shall not exceed 0.040 pound per MMBtu of actual heat input	Hourly emissions from the combustion of jet fuel/kerosene/petroleum distillate in this emission unit shall not exceed the following limits:
Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule	568.81 lbs NO _x /hr; 18.61 lbs CO/hr; 7.97 lbs VOC/hr; 10.63 lbs PM/hr; and 132.90 lbs SO ₂ /hr
Sulfur dioxide (SO ₂) emissions shall not exceed 0.5 pound per MMBtu of actual heat input, when using jet fuel, kerosene or other petroleum distillate, and see A.2.c	Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following limits:
Exempt from SO ₂ limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet, and see A.2.c	86.91 tons NO _x per rolling 12 months; 29.78 tons CO per rolling 12 months; 4.70 tons VOC per rolling 12 months; 3.14 ton PM per rolling 12 months; and 0.11 ton SO ₂ per rolling 12 months
Hourly emissions from the combustion of natural gas in this emissions unit shall not exceed the following limits:	Annual emissions from the combustion of jet fuel, kerosene, or other petroleum distillate in turbines installed in emissions units P001, P019, P020, and P028 shall not exceed the following limits:
287.06 lbs NO _x /hr with RB211 turbine;	4.17 tons NO _x per rolling 12 months;
29.24 lbs NO _x /hr with RB211 turbine with DLE;	0.14 ton CO per rolling 12 months;
122.27 lbs NO _x /hr with Avon or Allison turbine;	0.06 ton VOC per rolling 12 months;
50.50 lbs CO/hr;	0.08 ton PM per rolling 12 months;

and
0.98 ton SO₂ per rolling 12 months

See Section B1 through B4, and
A.2.d

See Section A.2.a through A.2.c
below

2. Additional Terms and Conditions

- 2.a** Any stationary gas turbine used at this test stand with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (10 million Btu/hr) but less than or equal to 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0150 * (14.4)/Y + F$$

where:

STD=allowable NO_x emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NO_x emission allowance for fuel-bound nitrogen.

N (below)=the nitrogen content of the fuel (percent by weight)

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NO_x percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NO_x percent by volume (F) will equal 0.04(N).

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If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal $0.004 + 0.0067(N-0.1)$.

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

- 2.b** Any stationary gas turbine used at this test stand with a heat input at peak load greater than 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0075 * (14.4)/Y + F$$

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NOx emission allowance for fuel-bound nitrogen.

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NOx percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NOx percent by volume (F) will equal $0.04(N)$.

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal $0.004 + 0.0067(N-0.1)$.

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

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- 2.c** Any stationary gas turbine used at this test stand which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:
- i. emissions from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis; or
 - ii. fuel shall not contain sulfur in excess of 0.8 percent by weight
- 2.d** If any turbine other than the RB211, the RB211 with the dry-low-emission controls (DLE), the Avon turbine, or the Allison turbine are tested or operated at this test stand, emission testing shall be conducted to provide emission factors and show compliance with the limits contained in this permit as per Section E.10. Test data shows that NO_x emissions from natural gas vary with the size and type turbine used; emission factors used to calculate NO_x, CO, VOC, PM, and SO₂ emissions shall be maintained along with the record of fuel usage.
- 2.e** The application and enforcement of the provisions of the New Source Performance Standards (NSPS), as promulgated by the United States Environmental Protection Agency, 40 CFR Part 60, are delegated to the Ohio Environmental Protection Agency. The requirements of 40 CFR Part 60 are also federally enforceable.

B. Operational Restrictions

1. This emissions unit shall only be fired with natural gas, jet fuel, kerosene, or other petroleum distillate oil.
2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months; and

Annual jet fuel, kerosene, and other petroleum distillate usage in turbines assembled at emissions units P001, P019, P020, and, P028 shall not exceed 30,000 gallons per rolling 12-months.

3. The quality of the jet fuel, kerosene, or other petroleum distillate burned in this emissions unit shall meet the following specifications on an "as received" basis:
 - a. a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound sulfur dioxide/MMBtu actual heat input, unless a lower limit is required per 40 CFR 60, Subpart GG; and,
 - b. greater than 130,000 Btu/gallon of oil.

Compliance with the above-mentioned specifications shall be determined by using monitoring and testing methods described in Sections C and E of this permit.

4. To ensure enforceability during the first 12 calendar months of operation, the fuel usage in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 and all turbines burning distillate fuels, including emissions units P001, P019, P020, and P028 shall not exceed the following fuel usage limits, as specified in the following table:

Month	Natural Gas (ft3)	Distillate fuels (gal) jet fuel/kerosene/other
1	27,500,000	2,500
2	55,000,000	5,000
3	82,500,000	7,500
4	110,000,000	10,000
5	137,500,000	12,500
6	165,000,000	15,000
7	192,500,000	17,500
8	220,000,000	20,000
9	247,500,000	22,500
10	275,000,000	25,000
11	302,500,000	27,500

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12

330,000,000

30,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas and jet fuel/kerosene/petroleum distillate usage for each turbine/compressor unit tested at this test stand during periods of operation. Records of fuel usage shall be maintained for each turbine/compressor unit installed at the test stand, per Section C.3 below.
2. The facility shall maintain a record of the company identification of each turbine installed at this test stand, which would reference the turbine size based on the heat input needed at peak load in MMBtu per hour and/or gigajoules per hour, the type of turbine and the manufacturer, and the date each turbine was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emission units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and/or reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type of fuel used.
4. The permittee shall collect or require the oil supplier to collect a representative grab sample for each shipment of petroleum distillates received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analysis for sulfur content and heat content in accordance with the following ASTM methods: ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and ASTM method D240 for heat content. Alternative, equivalent methods may be used upon written approval by the Ohio EPA Central District Office. For each shipment of oil received for burning in this emissions unit, the permittee shall maintain records of the type of distillate, the total quantity received, and the permittee's or oil supplier's analysis for sulfur content and heat content.
5. With each shipment of petroleum distillate oil received (jet fuel, kerosene, and any other petroleum distillate), or with any change in the quality of natural gas received at the facility, the representative sulfur dioxide emission rate from turbine fuels shall be calculated as specified in OAC rule

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3745-18-04(F):

- a. each shipment of petroleum distillate oil received shall be tested for the sulfur content and heat content or the oil supplier's analysis shall be provided, and the records of testing results maintained, per Section C.4. Until stack testing is conducted, as per Section E.10, the SO₂ per MMBtu emissions shall be determined per OAC rule 3745-18-04(F)(2);

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- b. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and,
 - c. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined per OAC rule 3745-18-04(F)(3).
6. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall monitor the sulfur content and nitrogen content of the fuel being fired, as required by 40 CFR 60, Subpart GG as follows:
 - a. if the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source; or,
 - b. if the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily, or if substantiated with the appropriate data and if approved by the Administrator, fuel vendors may develop custom schedules for determination of maximum sulfur and nitrogen content based on the design and operation of the source and the characteristics of the fuel supply; and,
 - c. results of the fuel analysis, taken after each new shipment of oil is received, shall be used as the daily value when calculating the 30-day rolling average until the next shipment is received.

D. Reporting Requirements

1. If a petroleum distillate oil is used in this emissions unit, the permittee shall submit, on a quarterly basis, copies of the permittee's or oil supplier's analysis for each shipment of oil which is received. The permittee's or oil supplier's analysis shall document the sulfur content (percent) and heat content (Btu/gallon) for each shipment of oil. The following information shall also be included with the copies of the permittee's or oil supplier's analysis:
 - a. the total quantity of jet fuel, kerosene, and/or other petroleum distillate received in each shipment (gallons);
 - b. the weighted* average sulfur dioxide emission rate (pounds/MMBtu) for the jet fuel,

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kerosene, and/or other petroleum distillate received during the calendar month; and,

- c. the weighted* average heat content (Btu/gallon) of the jet fuel, kerosene, and/or petroleum distillate received during the calendar month.

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These quarterly reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the oil shipments received and fuel used during the previous calendar quarters. If petroleum distillate oils are not used during the quarter, no report shall be required.

- In proportion to the quantity of jet fuel/kerosene/petroleum distillate received in each shipment during the month
2. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.4. These reports are due by the date described in Part 1 - General Terms and Conditions of this permit under Section A.2.
 3. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall submit quarterly reports, as required by 40 CFR 60, Subpart GG, to the Ohio EPA Central District Office. The following information shall also be included in this report:
 - a. any period of time during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during any performance test; and,
 - b. any period of time during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent by weight or emissions of sulfur dioxide exceed 0.015 percent by volume at 15 percent oxygen on a dry basis.

These quarterly emissions reports (only required if a turbine is in operation 60 days from the first testing date) shall include the average fuel consumption, ambient conditions, gas turbine load, the sulfur and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures used to compute the emissions, and shall be postmarked by the 30th day following the end of each calendar quarter.
 4. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.
 5. Pursuant to the NSPS, the source owner/operator is hereby advised of the requirement to report the following at the appropriate times:
 - a. construction date (no later than 30 days after such date);
 - b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);

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- c. actual start-up date (within 15 days after such date); and,
- d. date of performance testing (if required, at least 30 days prior to testing).

Reports shall include reference to the company identification of the turbine, the unit or serial number, and are to be sent to:

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P. O. Box 163669
Columbus, Ohio 43216-3669

and

Central District Office
3232 Alum Creek Drive
Columbus, Ohio 43207-3417

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with the following methods:

1. Emission Limitation

0.040 pound PM per million Btu of actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1, or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

Pollutant	Emission Factor	Source of Factor
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
PM w/ oil distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1

2. Emission limitation

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0.5 lb SO₂/MM Btu actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by testing the sulfur content and heat content of each shipment of petroleum distillates received and maintaining records of these testing results or the oil supplier's analysis, per Section C.4. Until stack testing is conducted, as per Section E.10, the SO₂ per MMBtu emissions shall be calculated per OAC rule 3745-18-04(F)(2) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.974$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the liquid fuel in Btu per gallon

D = the density of the liquid fuel in pounds per gallon; and

S = the decimal fraction of sulfur in the liquid fuel

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

3. SO₂ limitations contained in 40 CFR 60, Subpart GG

a. fuel shall not contain sulfur in excess of 0.8 percent by weight; or,

b. gases discharged from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis.

Applicable Compliance Method

Compliance with the fuel bound sulfur concentration and/or sulfur emissions limitation contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand.

- a. Fuel testing shall be conducted to demonstrate compliance with the allowable sulfur content and shall be determined as follows:

ASTM D2880 shall be used to determine the sulfur content of liquid fuels.

ASTM D1072, D3031, D4084, or D3246 shall be used to determine the sulfur content of gaseous fuels, as referenced in 40 CFR Part 60.335(d).

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The fuel analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency. The method and date of testing must be recorded along with the results.

- b. Emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 6 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the sulfur dioxide concentration limits contained in Subpart GG.

4. NOx limitations contained in 40 CFR 60, Subpart GG

- a. $\text{NOx } \{\text{STD}\} = 0.0150 * (14.4)/Y + F$ if peak load greater than 10 MM Btu/hr., and less than 100 MM Btu/hr, and

- b. $\text{NOx } \{\text{STD}\} = 0.0075 * (14.4)/Y + F$ if peak load greater than 100 MM Btu/hr

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis)

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour

F=NOx emission allowance for fuel-bound nitrogen

Applicable Compliance Method

Compliance with the nitrogen oxide emission limitations contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand. The emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 7 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the nitrogen oxide emissions and oxygen concentration limits contained in Subpart GG. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NOx emissions shall be determined at each of

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4 load conditions of 30, 50, 75, and 100 percent of peak load or at 4 points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. The nitrogen oxides emission rate shall be computed for each run using the equation found in 40 CFR 60.335(c)(1).

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5. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

6. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, and P023

86.91 tons NOx per rolling 12 months;
29.78 tons CO per rolling 12 months;
4.70 tons VOC per rolling 12 months;
3.14 ton PM per rolling 12 months; and
0.11 ton SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2-2 dated 10/96, or other factors derived from testing and approved by the Ohio EPA Central District Office:

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results

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CO w/ natural gas	0.19 lb/MM Btu
VOC w/ natural gas	0.03 lb/MM Bt
PM w/ natural gas	0.02 lb/MM Btu
SOX w/ natural gas	0.0007 lb/MM Bt

Facility Testing Results

Facility Testing Results

AP-42 Table 3.1-1

AP-42 Table 3.1-1

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Reciprocating Engines (P028 or P012):

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SO2 w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

*DLE= "Dry Low Emission"-new control technology

7. Rolling 12-month emission limitations when burning jet fuel, kerosene, and/or other petroleum distillate oils in all turbines using these fuels (P001, P019, P020, and P028)

4.17 tons NOx per rolling 12 months;
0.14 ton CO per rolling 12 months;
0.06 ton VOC per rolling 12 months;
0.08 ton PM per rolling 12 months; and
0.98 ton SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of jet fuel, kerosene, and/or other petroleum distillate in turbine/compressor test stand emissions units P001, P019, P020, and P028 shall be demonstrated through the monthly recordkeeping of the fuels consumed in these emissions units and adding the rolling 12-month total jet fuel, kerosene, and/or other petroleum distillate usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NOx w/distillates	2.14 lb/MM Btu	Facility Testing Results
CO w/distillates	0.07 lb/MM Btu	Facility Testing Results
VOC w/distillates	0.03 lb/MM Btu	Facility Testing Results
PM w/distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1
SOX w/distillates	0.50 lb/MM Btu	Limit from 3745-18-06(F)

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until testing

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

Rolls

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8. Hourly emission limits when using natural gas

287.06 lbs NO_x/hr with RB211 turbine;
29.24 lbs NO_x/hr with RB211 with DLE turbine;
122.27 lbs NO_x/hr with Avon or Allison turbine;
50.50 lbs CO/hr;
7.97 lbs VOC/hr;
5.32 lbs PM/hr; and
0.19 lb SO₂/hr

Applicable Compliance Method

Until testing is completed, compliance with the hourly emission limits from the combustion of natural gas in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96 or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NO _x w/ natural gas using RB211 turbine	1.08 lb/MM Btu E.10)	Facility Testing Results (see Section
NO _x w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu E.10)	Facility Testing Results (see Section
NO _x w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu E.10)	Facility Testing Results (see Section
CO w/ natural gas	0.19 lb/MM Btu E.10)	Facility Testing Results (see Section
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

* DLE="Dry Low Emission"-new control technology

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9. Hourly emission limits when using jet fuel, kerosene, or other petroleum distillate

568.81 lbs NO_x/hr;
18.61 lbs CO/hr;
7.97 lbs VOC/hr;
10.63 lbs PM/hr; and
132.90 lbs SO₂/hr

Applicable Compliance Method

Until testing has been conducted, compliance with the hourly emissions from the combustion of jet fuel, kerosene, or other petroleum distillate in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96 or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NO _x w/ fuel oil	2.14 lb/MM Btu Section E.10)	Facility Testing Results (see
CO w/ fuel oil	0.07 lb/MM Btu Results (see Section E.10)	Facility Testing
VOC w/ fuel oil	0.03 lb/MM Btu	Facility Testing Results
PM w/ fuel oil	0.04 lb/MM Btu	AP-42 Table 3.1-1
SO _x w/ fuel oil	0.50 lb/MM Btu until testing (see Section C.4 and Section E.10)	Limit from 3745-18-06(F)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

10. Emission limits

287.06 lbs NO_x/hr with RB211 turbine when using natural gas;
29.24 lbs NO_x/hr with RB211 turbine with DLE when using natural gas;
122.27 lbs NO_x/hr with Avon or Allison turbine when using natural gas;
50.50 lbs CO/hr when using natural gas;
568.81 lbs NO_x/hr when using jet fuel/kerosene/petroleum distillate;

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18.61 lbs CO/hr when using jet fuel/kerosene/petroleum distillate; and
132.90 lbs SO₂/hr when using jet fuel/kerosene/petroleum distillate

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

a. emission testing for the combustion of natural gas shall be conducted one time during the term of this permit on one of each type of turbine and within 6 months after issuance of the permit, or when installed if any one of the turbine types are not installed within this time frame; and if at any time, jet fuel, kerosene, and/ or other petroleum distillate is to be used in P001, P019, P020, or P028 the permittee shall conduct, or have conducted, at the time of use or within 2 months of the use of this fuel, emission testing for one test turbine, to represent emissions of all test turbines burning jet fuel, kerosene, and/or other petroleum distillate;

b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide when using either fuel type and, in addition, sulfur oxides when using jet fuel, kerosene, or other petroleum distillate;

c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 20, Method 10, and Method 9

Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.

d. the tests shall be conducted for each turbine type using natural gas (RB211, RB211 with DLE, and a Avon or Allison) installed at any one of the emissions units represented in the rolling 12-month limits of this permit (P001, P004, P019, P020, P023, and P028), and as per Section E.10.a for distillates;

e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;

f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit

Emissions Unit ID: **P020**

operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;

- g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and,
- h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

This Permit to Install (01-8077) replaces Permit to Install 01-4996, in the name of Cooper Energy Services, for this emissions unit.

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Emissions Unit ID: **P023**

PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	
Compressor Test Stand (stack 87-S-09) using Natural Gas	OAC rule 3745-17-11(B)(4)	OAC rule 3745-31-05(D)
	OAC rule 3745-17-07(A)(1)	
	OAC rule 3745-18-06(F)	
	OAC rule 3745-18-06(A)	
	OAC rule 3745-31-05(A)(3)	40 CFR 60, Subpart GG, Standards of Performance for Stationary Gas Turbines

Applicable Emissions Limitations/Control Measures	Emissions
Particulate emissions shall not exceed 0.040 pound per MMBtu of actual heat input	86.91 tons NOx per rolling 12 months; 29.78 tons CO per rolling 12 months; 4.70 tons VOC per rolling 12 months;
Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule	3.14 ton PM per rolling 12 months; and 0.11 ton SO2 per rolling 12 months
Sulfur dioxide emissions shall not exceed 0.5 pound per MMBtu of actual heat input	See Section B1 through B3, and A.2 This turbine was manufactured prior to 10/3/77 and is exempt from this subpart
Exempt from SO2 limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet	
Hourly emissions from the combustion of natural gas in this emissions unit shall not exceed the following limits:	
122.27 lbs NOx/hr; 50.50 lbs CO/hr; 7.97 lbs VOC/hr; 5.32 lbs PM/hr; and 0.19 lb SO2/hr	
Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following limits:	

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2. Additional Terms and Conditions

2.a If the Avon turbine is replaced at this test stand a new Permit to Install shall be required prior to installation.

B. Operational Restrictions

1. This emissions unit shall only be fired with natural gas. The turbine installed at this test stand was manufactured in the 1960's and is exempt from 40 CFR 60 Subpart GG; this turbine cannot be changed-out and/or replaced with another without applying for a Permit to Install for the inclusion of these requirements.

2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months.

3. To ensure enforceability during the first 12 calendar months of operation, the fuel usage from all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following natural gas usage limits, as specified in the following table:

Month	Natural Gas (ft3)
1	27,500,000
2	55,000,000
3	82,500,000
4	110,000,000
5	137,500,000
6	165,000,000
7	192,500,000
8	220,000,000
9	247,500,000
10	275,000,000
11	302,500,000
12	330,000,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

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1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas usage for each compressor unit tested at this test stand during periods of operation. Records of fuel usage shall be maintained for each compressor unit installed at the test stand, per Section C.3 below.
2. The facility shall maintain a record of the date each compressor was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emission units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and/or reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type of fuel used.
4. The representative sulfur dioxide emission rate from the natural gas used in this emissions unit shall be calculated as specified in OAC rule 3745-18-04(F):
 - a. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pounds of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and,
 - b. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined per OAC rule 3745-18-04(F)(3).

D. Reporting Requirements

1. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.3. These reports are due by the date described in Part 1 - General Terms and Conditions of this permit under Section A.2.
2. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with the following methods:

1. Emission Limitation

0.040 pound PM per million Btu of actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1, or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

Pollutant	Emission Factor	Source of Factor
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1

2. Emission limitation

0.5 lb SO₂/mm Btu actual heat input

Applicable Compliance Method

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a

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sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

3. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

4. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, and P023

86.91 tons NO_x per rolling 12 months;

29.78 tons CO per rolling 12 months;

4.70 tons VOC per rolling 12 months;

3.14 ton PM per rolling 12 months; and

0.11 ton SO₂ per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2-2 dated 10/96, or other

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factors derived from future testing and approved by the Ohio EPA Central District Office:

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using RB211 turbine w/DLE*	0.11 lb/MM Btu	Facility Testing Results
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOX w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

Reciprocating Engines (P028 or P012):

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SO2 w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

*DLE="Dry Low Emission"-new control technology

5. Hourly emission limits when using natural gas in the Avon turbine

122.27 lbs NOx/hr;
50.50 lbs CO/hr;
7.97 lbs VOC/hr;
5.32 lbs PM/hr; and
0.19 lb SO2/hr

Applicable Compliance Method

Until testing is completed, compliance with the hourly emission limits from the combustion of

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natural gas from the turbine, in the testing of any compressor installed at this test stand, shall be demonstrated through the calculation of emissions from the combustion of natural gas in the turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or factors derived from future testing and approved by the Ohio EPA Central District Office:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	0.46 lb/MM Btu	Facility Testing Results (see Section E.6)
w/Avon turbine		
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results (see Section E.6)
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOx w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

6. Emission limits

122.27 lbs NOx/hr using natural gas with Avon turbine;
50.50 lbs CO/hr using natural gas;

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- a. the emission testing shall be conducted one time during the term of this permit and within 6 months after issuance of the permit;
- b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide;
- c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 20, Method 10, and Method

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Emissions Unit ID: **P023**

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Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA.

- d. the tests shall be conducted at this test stand or by testing any turbine of equal size (an Avon or Allison turbine), that is installed and operating at the time testing is scheduled, and at any one of the emissions units represented in the rolling 12-month limits of this permit (P001, P004, P019, P020, P023, and P028);
- e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;
- f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;

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- g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and,
- h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

This Permit to Install (01-8077) replaces Permit to Install 01-4996, in the name of Cooper Energy Services, for this emissions unit.

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To be entered upon final issuance

Emissions Unit ID: **P028**

PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
Reciprocating Engine/Turbine/ /Compressor Test Stand (stack 90-S-08) using Natural Gas, Diesel, Jet Fuel, Kerosene, or other Petroleum Distillate	OAC rule 3745-17-11(B)(5)
	OAC rule 3745-31-05(A)(3)
	OAC rule 3745-17-11(B)(4)
	OAC rule 3745-17-07(A)(1)
	OAC rule 3745-18-06(F) & (G)
OAC rule 3745-18-06(A)	

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Emissions Unit ID: **P028**

Applicable Emissions

Limitations/Control Measures

Particulate emissions shall not exceed 0.062 pound per MMBtu of actual heat input for large bore internal combustion engine; and shall not exceed 0.31 pound per MMBtu of actual heat input for a small bore internal combustion engine

Particulate emissions shall not exceed 0.040 pound per MMBtu of actual heat input for a stationary gas turbine

Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule

Sulfur dioxide (SO₂) emissions shall not exceed 0.5 pound per MMBtu of actual heat input, when using diesel fuel, jet fuel, kerosene, or other petroleum distillate, and see A.2.c

Exempt from SO₂ limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet, and see A.2.c

Hourly emissions from the combustion of natural gas in reciprocating engines installed at this emissions unit shall not exceed the following limits:

OAC rule 3745-31-05(D)

40 CFR 60, Subpart GG –
Standards of Performance for
Stationary Gas Turbines

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24.40 lbs NO _x /hr; 29.28 lbs CO/hr; 12.20 lbs VOC/hr; 0.732 lbs PM/hr; and 0.017 lb SO ₂ /hr	limits: 568.81 lbs NO _x /hr; 18.61 lbs CO/hr; 7.97 lbs VOC/hr; 10.63 lbs PM/hr; and 132.90 lbs SO ₂ /hr	0.98 tons SO ₂ per rolling 12 months
Hourly emissions from the combustion of diesel fuel in reciprocating engines installed at this emissions unit shall not exceed the following limits:	Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following limits:	Annual emissions from the combustion of diesel fuel in reciprocating engines installed in emissions units P028 and P012 shall not exceed the following limits: 5.85 tons NO _x per rolling 12 months; 1.56 tons CO per rolling 12 months; 2.17 tons VOC per rolling 12 months; 0.08 ton PM per rolling 12 months; and 0.65 tons SO ₂ per rolling 12 months
47.52 lbs NO _x /hr; 12.67 lbs CO/hr; 17.64 lbs VOC/hr; 0.65 lbs PM/hr; and 5.28 lbs SO ₂ /hr	86.91 tons NO _x per rolling 12 months; 29.78 tons CO per rolling 12 months; 4.70 tons VOC per rolling 12 months; 3.14 tons PM per rolling 12 months; and 0.11 ton SO ₂ per rolling 12 months	See Section B.1 through B.4
Hourly emissions from the combustion of natural gas in turbines installed in this emissions unit shall not exceed the following limits:	Annual emissions from the combustion of jet fuel, kerosene, or other petroleum distillate oil in turbines installed in emissions units P001, P004, P019, P020, P023, and P028 shall not exceed the following limits:	See Section A.2.1.a through A.2.1.c
287.06 lbs NO _x /hr with RB211 turbine; 29.24 lbs NO _x /hr with RB211 turbine with DLE; 122.27 lbs NO _x /hr with Avon or Allison turbine; 50.50 lbs CO/hr; 7.97 lbs VOC/hr; 5.32 lbs PM/hr; and 0.19 lb SO ₂ /hr	4.17 tons NO _x per rolling 12 months; 0.14 tons CO per rolling 12 months; 0.06 tons VOC per rolling 12 months; 0.08 ton PM per rolling 12 months; and	
Hourly emissions from the combustion of jet fuel/kerosene/petroleum distillate in turbines installed in this emission unit shall not exceed the following		

2. Additional Terms and Conditions

- 2.a** Any stationary gas turbine used at this test stand with a heat input at peak load equal to or greater than 10.7 gigajoules per hour (10 million Btu/hr) but less than or equal to 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0150 * (14.4)/Y + F$$

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NOx emission allowance for fuel-bound nitrogen.

N (below)=the nitrogen content of the fuel (percent by weight)

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NOx percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NOx percent by volume (F) will equal 0.04(N).

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal 0.004 + 0.0067(N-0.1).

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

- 2.b** Any stationary gas turbine used at this test stand with a heat input at peak load greater than 107.2 gigajoules per hour (100 million Btu/hr), based on the lower heating value of the fuel fired, and which remains on site 60 days after achieving the maximum production

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rate at

which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

Nitrogen Oxides shall not exceed this amount:

$$\text{STD} = 0.0075 * (14.4)/Y + F$$

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis).

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour.

F=NOx emission allowance for fuel-bound nitrogen.

F shall be defined according to the nitrogen (N) content of the fuel as follows:

If fuel bound N is less than or equal to 0.015% (percent by wt.), NOx percent by volume (F) will equal zero.

If fuel bound N is greater than 0.015% and less than or equal to 0.1% (percent by wt.), NOx percent by volume (F) will equal 0.04(N).

If fuel bound N is greater than 0.1% and less than or equal to 0.25% (percent by wt.), NOx percent by volume (F) will equal 0.004 + 0.0067(N-0.1).

If fuel bound N is greater than 0.25% (percent by wt.), NOx percent by volume (F) will equal to 0.005.

2.c Any stationary gas turbine used at this test stand which remains on site 60 days after achieving the maximum production rate at which the unit will be operated, shall meet the following limits within this 60 days and not later than 180 days after initial startup of the unit:

a. emissions from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis; or

- b. fuel shall not contain sulfur in excess of 0.8 percent by weight
- 2.d** If any turbine other than the RB211, the RB211 with the dry-low-emission controls (DLE), the Avon turbine, or the Allison turbine are tested or operated at this test stand, emission testing shall be conducted to provide emission factors and show compliance with the limits contained in this permit as per Section E.8. Test data shows that NO_x emissions from

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natural gas vary with the size and type turbine used; emission factors used to calculate NO_x, CO, VOC, PM, and SO₂ emissions shall be maintained along with the record of fuel usage when testing a turbine at this test stand.

B. Operational Restrictions

1. This emissions unit shall only be fired with natural gas, jet fuel, kerosene, or other petroleum distillate when running a turbine or with natural gas or diesel fuel when operating a reciprocating engine.
2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months;

Annual jet fuel, kerosene, and other petroleum distillate usage in turbines assembled at emissions units P001, P019, and P020, and P028 shall not exceed 30,000 gallons per rolling 12-months; and

Annual diesel fuel usage in reciprocating engines assembled at emissions units P012 and P028 shall not exceed 20,000 gallons per rolling 12-months.

3. The quality of the diesel fuel, jet fuel, kerosene, or other petroleum distillate oil burned in this emissions unit shall meet the following specifications on an "as received" basis:
 - a. a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound sulfur dioxide/mmBtu actual heat input, unless a lower limit is required per 40 CFR 60, Subpart GG; and
 - b. greater than 130,000 Btu/gallon of oil.

Compliance with the above-mentioned specifications shall be determined by using monitoring and testing methods described in Sections C and E of this permit.

4. To ensure enforceability during the first 12 calendar months of operation, the fuel usage in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012, all turbines burning jet fuel or other distillate fuels, including emissions units P001, P019, P020, and P028, and all reciprocating engines burning diesel fuel, including emissions units P012 and P028, shall not exceed the following fuel usage limits, as specified in the following table:

Month	Natural Gas (ft ³)	Jet Fuel/Kerosene other (gal)	Diesel fuel (gal)
1	27,500,000	2,500	1,667

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2	55,000,000	5,000	3,333
3	82,500,000	7,500	5,000
4	110,000,000	10,000	6,666
5	137,500,000	12,500	8,333
6	165,000,000	15,000	10,000
7	192,500,000	17,500	11,666
8	220,000,000	20,000	13,333
9	247,500,000	22,500	15,000
10	275,000,000	25,000	16,666
11	302,500,000	27,500	18,333
12	330,000,000	30,000	20,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas and oil usage for each reciprocating engine/turbine/compressor unit tested at this test stand during periods of operation. Records of natural gas and oil usage shall be maintained for each reciprocating engine and turbine installed at the test stand, per Section C.3 below.
2. The facility shall maintain a record of the company identification of each reciprocating engine or turbine installed at this test stand, which would reference the size based on the heat input needed at peak load in MMBtu per hour and/or gigajoules per hour, the type of turbine and the manufacturer, and the date each reciprocating engine or turbine was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emissions units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and/or reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type fuel used.
4. The permittee shall collect or require the oil supplier to collect a representative grab sample for each shipment of petroleum distillate oil that is received (diesel fuel, kerosene, jet fuel, and any other petroleum distillate) for burning in this emissions unit. The permittee shall perform or require the supplier

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to perform the analyses for sulfur content and heat content in accordance with the following ASTM methods: ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and ASTM method D240 for heat content. Alternative, equivalent methods may be used upon written approval by the Ohio EPA Central District Office. For each shipment of petroleum distillate oil received for burning in this emissions unit, the permittee shall maintain records of the total quantity of oil received and the permittee's or oil supplier's analyses for sulfur content and heat content.

5. With each shipment of petroleum distillate oil received (diesel fuel, kerosene, jet fuel, and any other petroleum distillate) or with any change in the quality of natural gas received at the facility, the representative sulfur dioxide emission rate from reciprocating engine or turbine fuels shall be calculated as specified in OAC rule 3745-18-04(F):
 - a. each shipment of petroleum distillate oil received shall be tested for the sulfur content and heat content or the oil supplier's analyses shall be provided, and the records of testing results maintained, per Section C.4. Until stack testing is conducted, as per Section E.8, the SO₂ per MMBtu emissions shall be determined per OAC rule 3745-18-04(F)(2);
 - b. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)4; and
 - c. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined as per OAC rule 3745-18-04(F)(3).
6. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand, the facility shall monitor the sulfur content and nitrogen content of the fuel being fired, as required by 40 CFR 60, Subpart GG as follows:
 - a. if the turbine is supplied its fuel from a bulk storage tank, the values shall be determined on each occasion that fuel is transferred to the storage tank from any other source; or
 - b. if the turbine is supplied its fuel without intermediate bulk storage the values shall be determined and recorded daily, or if substantiated with the appropriate data and if approved by the Administrator, fuel vendors may develop custom schedules for determination of maximum sulfur and nitrogen content based on the design and operation of the source and the characteristics of the fuel supply; and

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- c. results of the fuel analysis, taken after each new shipment of oil is received, shall be used as the daily value when calculating the 30-day rolling average until the next shipment is received.

D. Reporting Requirements

1. The permittee shall submit, on a quarterly basis, copies of the permittee's or oil supplier's analyses for each shipment of diesel fuel, kerosene, jet fuel, and any other petroleum distillate oil which is received for burning in this emissions unit. The permittee's or oil supplier's analyses shall document the sulfur content (percent) and heat content (Btu/gallon) for each shipment of oil. The following information shall also be included with the copies of the permittee's or oil supplier's analyses:

- a. the total quantity of diesel fuel, kerosene, jet fuel, and other petroleum distillate oil received in each shipment (gallons);
- b. the weighted* average sulfur dioxide emission rate (pounds/mmBtu) for the diesel fuel, kerosene, jet fuel, and other petroleum distillate oil received during the calendar month; and
- c. the weighted* average heat content (Btu/gallon) of the diesel fuel, kerosene, jet fuel, and other petroleum distillate oil received during the calendar month.

These quarterly reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the oil shipments received during the previous calendar quarters.

* In proportion to the quantity of oil received in each shipment during the month

2. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.4. These reports are due by the date described in Part 1 - General Terms and Conditions of this permit under Section A.2.

3. Within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine installed at this test stand, the facility shall submit quarterly reports, as required by 40 CFR 60, Subpart GG, to the Ohio EPA Central District Office. The following information shall also be included in this report:

- a. any period of time during which the fuel-bound nitrogen of the fuel is greater than the maximum nitrogen content allowed by the fuel-bound nitrogen allowance used during any performance test; and
- b. any period of time during which the sulfur content of the fuel being fired in the gas turbine exceeds 0.8 percent by weight or emissions of sulfur dioxide exceed 0.015 percent by volume at 15 percent oxygen on a dry basis.

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These quarterly emissions reports (only required if a turbine is in operation 60 days from the first testing date) shall include the average fuel consumption, ambient conditions, gas turbine load, the sulfur and nitrogen content of the fuel during the period of excess emissions, and the graphs or figures used to compute the emissions, and shall be postmarked by the 30th day following the end of each calendar quarter.

4. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.

5. If any turbine/compressor unit is installed at this test stand, pursuant to the NSPS requirements, the facility shall submit the following reports at the appropriate times:

- a. construction date (no later than 30 days after such date);
- b. anticipated start-up date (not more than 60 days or less than 30 days prior to such date);
- c. actual start-up date (within 15 days after such date); and,
- d. date of performance testing (if required, at least 30 days prior to testing).

Reports shall include reference to the company identification of the turbine, the unit or serial number, and shall be sent to:

Ohio Environmental Protection Agency
DAPC - Permit Management Unit
P. O. Box 163669
Columbus, Ohio 43216-3669

and

Ohio Environmental Protection Agency
Central District Office, DAPC
3232 Alum Creek Drive
Columbus, Ohio 43207-3417

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with

the following methods:

1 Emission Limitation

0.062 pound PM per million Btu of actual heat input for large bore internal combustion engine
0.31 pound PM per million Btu of actual heat input for small bore internal combustion engine
0.040 pound PM per million Btu of actual heat input for stationary gas turbine

Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.4-2, 3.2-2 and 3.1-1 (or other factors approved by the Ohio EPA), or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

Pollutant	Emission Factor	Source of Factor
PM w/ diesel in engine	0.062 lb PM/MM Btu	AP-42 Table 3.4-2
PM w/ natural gas in engine	0.03 lb PM/MM Btu	AP-42 Table 3.2-2
PM w/ distillate in turbine	0.04 lb PM/MM Btu	AP-42 Table 3.1-1
PM w/ natural gas in turbine	0.02 lb PM/MM Btu	AP-42 Table 3.1-1

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2. Emission limitation

0.5 lb SO₂/mm Btu actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by testing the sulfur content and heat content of each shipment of diesel fuel, kerosene, jet fuel, and any other petroleum distillate oil received and maintaining records of these testing results or the oil supplier's analyses, per Section C.4. Until stack testing is conducted, as per Section E.8, the SO₂ per MMBtu emissions shall be calculated per OAC rule 3745-18-04(F)(2) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.974$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the liquid fuel in Btu per gallon

D = the density of the liquid fuel in pounds per gallon

S = the decimal fraction of sulfur in the liquid fuel

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

3. SO₂ limitations contained in 40 CFR 60, Subpart GG for turbines

a. fuel shall not contain sulfur in excess of 0.8 percent by weight; or

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- b. gases discharged from this emissions unit shall not contain SO₂ in excess of 0.015 percent by volume at 15 percent oxygen on a dry basis.

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Applicable Compliance Method

Compliance with the fuel bound sulfur concentration and/or sulfur emissions limitation contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand.

- a. Fuel testing shall be conducted to demonstrate compliance with the allowable sulfur content and shall be determined as follows:

ASTM D2880 shall be used to determine the sulfur content of liquid fuels.

ASTM D1072, D3031, D4084, or D3246 shall be used to determine the sulfur content of gaseous fuels, as referenced in 40 CFR Part 60.335(d).

The fuel analysis may be performed by the owner or operator, a service contractor retained by the owner or operator, the fuel vendor, or any other qualified agency. The method and date of testing must be recorded along with the results.

- b. Emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 6 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the sulfur dioxide concentration limits contained in Subpart GG.

4. NOx limitations contained in 40 CFR 60, Subpart GG for turbines

- a. $\text{NO}_x \text{ \{STD\}} = 0.0150 * (14.4)/Y + F$ if peak load greater than 10 MM Btu/hr., and less than 100 MM Btu/hr, and

- b. $\text{NO}_x \text{ \{STD\}} = 0.0075 * (14.4)/Y + F$ if peak load greater than 100 MM Btu/hr

where:

STD=allowable NOx emissions (percent by volume at 15 percent oxygen and on a dry basis)

Y=manufacturer's rated heat rate at manufacturer's rated peak load (kilojoules per watt hour), or actual measured heat rate based on lower heating value of fuel as measured at actual peak load for the emissions unit. The value of Y shall not exceed 14.4 kilojoules per watt hour

F=NOx emission allowance for fuel-bound nitrogen

Applicable Compliance Method

Compliance with the nitrogen oxide emission limitations contained in 40 CFR 60, Subpart GG, shall be determined through testing, which shall be required within 60 days after achieving the maximum production rate at which the emissions unit will be operated, but not later than 180 days after initial startup of any turbine/compressor unit installed at this test stand. The emissions testing shall be conducted to demonstrate compliance with the allowable mass emission rates and shall be determined as follows:

40 CFR Part 60, Appendix A, Method 20 (when using natural gas) or Methods 7 (when using jet fuel/kerosene/petroleum distillate) shall be used to determine compliance with the nitrogen oxide emissions and oxygen concentration limits contained in Subpart GG. The span values shall be 300 ppm of nitrogen oxide and 21 percent oxygen. The NOx emissions shall be determined at each of 4 load conditions of 30, 50, 75, and 100 percent of peak load or at 4 points in the normal operating range of the gas turbine, including the minimum point in the range and peak load. The nitrogen oxides emission rate shall be computed for each run using the equation found in 40 CFR 60.335(c)(1).

5. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

6. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012

86.91 tons NOx per rolling 12 months;
29.78 tons CO per rolling 12 months;
4.70 tons VOC per rolling 12 months;
3.14 ton PM per rolling 12 months; and
0.11 ton SO2 per rolling 12 months

Applicable Compliance Method

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Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2-2 dated 10/96, or other factors derived from testing and approved by the Ohio EPA Central District Office:

Reciprocating Engines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility testing Results
CO w/ natural gas	1.20 lb/MM Btu	Facility testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SOx w/ natural gas	0.0007 lb/MM Btu	Facility testing Results

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results (see Section E.8)
NOx w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu	Facility Testing Results (see Section E.8)
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results (see Section E.8)
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOx w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

*DLE="Dry Low Emission"-new control technology

7. Rolling 12-month emission limits from diesel fuel combustion in all facility reciprocating engines installed at test stand(s) P012 and P028.

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5.85 tons NOx per rolling 12 months;
1.56 tons CO per rolling 12 months;
2.17 tons VOC per rolling 12 months;
0.08 ton PM per rolling 12 months; and
0.65 tons SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of diesel fuel in all reciprocating engines, including emissions units P028, and P012, shall be demonstrated through the monthly recordkeeping of the total diesel fuel consumed in all reciprocating engines using these fuels, and adding the rolling 12-month total diesel fuel usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.4-2 dated 10/96 or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Reciprocating Engine:

Pollutant	Emission Factor	Source of Factor
NOx w/ diesel	4.50 lb/MM Btu	Facility testing Results
CO w/ diesel	1.20 lb/MM Btu	Facility testing Results
VOC w/ diesel	1.67 lb/MM Btu	Facility testing Results
PM w/ diesel	0.062 lb/MM Btu	AP-42 Table 3.4-2
SOx w/ diesel	0.50 lb/MM Btu	Limit from 3745-18-06(G)

8. Rolling 12-month emission limitations when burning jet fuel, kerosene, and/or other petroleum distillate oils in all turbines using these fuels (P001, P019, P020, and P028)

4.17 tons NOx per rolling 12 months;
0.14 ton CO per rolling 12 months;
0.06 ton VOC per rolling 12 months;
0.08 ton PM per rolling 12 months; and
0.98 ton SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of jet fuel, kerosene, and/or other petroleum distillate in turbine/compressor test stand emissions units P001, P019, P020, and P028 shall be demonstrated through the monthly recordkeeping of the fuels consumed in these emissions units and adding the rolling 12-month total jet fuel, kerosene, and/or other petroleum distillate usage each month. Emissions shall be calculated using the following worst

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case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/distillates	2.14 lb/MM Btu	Facility Testing Results
CO w/distillates	0.07 lb/MM Btu	Facility Testing Results
VOC w/distillates	0.03 lb/MM Btu	Facility Testing Results
PM w/distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1
SOx w/distillates	0.50 lb/MM Btu	Limit from 3745-18-06(F) until testing

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

9. Hourly emission limits when using diesel fuel in reciprocating engines

47.52 lbs NOx/hr;
12.67 lbs CO/hr;
17.64 lbs VOC/hr;

0.65 lbs PM/hr; and
5.28 lbs SO2/hr

Applicable Compliance Method

Until testing has been completed, compliance with the hourly emission limits from the combustion of diesel fuel in the testing of any reciprocating engine installed at this test stand shall be demonstrated through the calculation of emissions from the largest fuel capacity reciprocating engine that could be installed at this test stand and recordkeeping of the maximum diesel fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.4-2 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Reciprocating Engine:

Pollutant	Emission Factor	Source of Factor
NOx w/ diesel	4.50 lb/MM Btu	Facility testing results (see Section E.9)
CO w/ diesel	1.20 lb/MM Btu	Facility testing results (see section E.9)

VOC w/ diesel	1.67 lb/MM Btu	Facility testing results
PM w/ diesel	0.062 lb/MM Btu	AP-42 Table 3.4-2
SOx w/ diesel	0.50 lb/MM Btu	Limit from 3745-18-06(G)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

10. Hourly emission limits when using distillate fuels in turbines

568.81 lbs NOx/hr;
18.61 lbs CO/hr;
7.97 lbs VOC/hr;
10.63 lbs PM/hr; and
132.90 lbs SO2/hr

Applicable Compliance Method

Until testing has been completed, compliance with the hourly emission limits from the combustion of kerosene, jet fuel, or other distillate oil in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum distillate fuel oil that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.1-1 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

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Turbine:

Pollutant	Emission Factor	Source of Factor
NOx w/distillates	2.14 lb/MM Btu	Facility Testing Results (see Section E.8)
CO w/distillates	0.07 lb/MM Btu	Facility Testing Results (see Section E.8)
VOC w/distillates	0.03 lb/MM Btu	Facility Testing Results
PM w/distillates	0.04 lb/MM Btu	AP-42 Table 3.1-1
SOx w/distillates	0.50 lb/MM Btu	Limit from 3745-18-06(F) (see Section C.4 and E.8)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

11. Hourly Emission Limit when using natural gas in reciprocating engines

24.40 lbs NOx/hr;
29.28 lbs CO/hr;
12.20 lbs VOC/hr;
0.732 lbs PM/hr; and
0.017 lb SOx/hr

Applicable Compliance Method

Until testing has been completed, compliance with the hourly emission limits from the combustion of natural gas in the testing of any reciprocating engine installed at this test stand shall be demonstrated through the calculation of emissions from the largest fuel capacity reciprocating engine that could be installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.2-2 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Reciprocating Engines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results (see section E.8)
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results (see Section E.8)
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SOx w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

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To be entered upon final issuance

Emissions Unit ID: **P028**

12. Hourly Emission Limit when using natural gas in turbines

287.06 lbs NO_x/hr with RB211 turbine;
29.24 lbs NO_x/hr with RB211 turbine with DLE;
122.27 lbs NO_x/hr with Avon or Allison turbine;
50.50 lbs CO/hr;
7.97 lbs VOC/hr;
5.32 lbs PM/hr; and
0.19 lb SO₂/hr

Applicable Compliance Method

Until testing has been completed, compliance with the hourly emission limits from the combustion of natural gas in the testing of any turbine installed at this test stand shall be demonstrated through the calculation of emissions from the combustion of natural gas in each turbine installed at this test stand and recordkeeping of the maximum fuel that could be consumed per hour. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 dated 10/96, or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Turbine:

Pollutant	Emission Factor	Source of Factor
NO _x w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results (see Section E.8)
NO _x w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu	Facility Testing Results (see Section E.8)
NO _x w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results (see Section E.8)
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results (see Section E.8)
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SO _x w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

* DLE="Dry Low Emission"-new control technology

13. Emission Limits

47.52 lbs NO_x/hr when using diesel fuel in reciprocating engines;
12.67 lbs CO/hr when using diesel fuel in reciprocating engines;
24.4 lbs NO_x/hr when using natural gas in reciprocating engines;
29.28 lbs CO/hr when using natural gas in reciprocating engines;
568.81 lbs NO_x/hr when using distillate fuels in turbines;
18.61 lbs CO/hr when using distillate fuels in turbines;
132.90 lbs SO₂/hr when using distillate fuels in turbines;
287.06 lbs NO_x/hr when using natural gas in RB211 turbines;
29.24 lbs NO_x/hr when using natural gas in RB211 with DLE turbines;
122.27 lbs NO_x/hr when using natural gas in Avon and Allison turbines; and
50.50 lbs CO/hr when using natural gas in turbines

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- a. emission testing for the combustion of natural gas and diesel fuel shall be conducted one time during the term of this permit on the largest reciprocating engine burning each fuel, and within 6 months after issuance of the permit, or when installed if no engine burning natural gas is in operation within this time frame (P012 or P028); and emission testing for the combustion of natural gas shall be conducted one time during the term of this permit on one of each type of turbine and within 6 months after issuance of the permit, or when installed if any one of the turbine types are not installed within this time frame; and if at any time, jet fuel, kerosene, and/or other petroleum distillate is to be used in P001, P019, P020, or P028 the permittee shall conduct, or have conducted, at the time of use or within 2 months of the use of this fuel, emission testing for one test turbine, to represent emissions of all test turbines burning jet fuel, kerosene, and/or other petroleum distillate;
- b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide when using any fuel type and, in addition, sulfur oxides when using petroleum distillates in a turbine;
- c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 7, Method 20, Method 10, and Method 9. Alternative U.S. EPA approved test methods may be used with prior approval from the Ohio EPA

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- d. tests shall be conducted using the largest reciprocating engine using each fuel installed at the time testing is scheduled, and tests shall be conducted for each turbine type using natural gas (RB211, RB211 with DLE, and a Avon or Allison) installed at any one of the emissions units represented in the rolling 12-month limits of this permit (P001, P004, P019, P020, P023, and P028), and as per Section E.13.a for jet fuel or kerosene;
- e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;
- f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;

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g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and

h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

None

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Emissions Unit ID: **P012**

PART II: SPECIAL TERMS AND CONDITIONS [Continued]

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operations(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>
Reciprocating Engine /Compressor Test Stand (stack 90-S-07) using Natural Gas and Diesel	OAC rule 3745-17-11(B)(5)
	OAC rule 3745-17-07(A)(1)
	OAC rule 3745-18-06(G)
	OAC rule 3745-18-06(A)
	OAC rule 3745-31-05(A)(3)
	OAC rule 3745-31-05(D)

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<u>Applicable Emissions</u> <u>Limitations/Control Measures</u>	Hourly emissions from the combustion of diesel fuel in this emissions unit shall not exceed the following limits:
Particulate emissions shall not exceed 0.062 pound per MMBtu of actual heat input for large bore internal combustion engine; and shall not exceed 0.31 pound per MMBtu of actual heat input for a small bore internal combustion engine	47.52 lbs NOx/hr; 12.67 lbs CO/hr; 17.64 lbs VOC/hr; 0.65 lbs PM/hr; and 5.28 lbs SO2/hr
Visible particulate emissions from any stack shall not exceed twenty per cent opacity, as a six-minute average, except as otherwise specified by rule	Annual emissions from the combustion of natural gas in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed the following limits:
Sulfur dioxide emissions shall not exceed 0.5 pound per MMBtu of actual heat input	86.91 tons NOx per rolling 12 months; 29.78 tons CO per rolling 12 months; 4.70 tons VOC per rolling 12 months; 3.14 tons PM per rolling 12 months; and 0.11 ton SO2 per rolling 12 months
Exempt from SO2 limitations when burning only natural gas having a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.6 pound per million standard cubic feet	Annual emissions from the combustion of diesel fuel in reciprocating engines installed in emissions units P028 and P012 shall not exceed the following limits:
Hourly emissions from the combustion of natural gas in this emissions unit shall not exceed the following limits:	5.85 tons NOx per rolling 12 months; 1.56 tons CO per rolling 12 months; 2.17 tons VOC per rolling 12 months; 0.08 ton PM per rolling 12 months; and 0.65 tons SO2 per rolling 12 months
24.40 lbs NOx/hr; 29.28 lbs CO/hr; 12.20 lbs VOC/hr; 0.732 lbs PM/hr; and 0.017 lb SO2/hr	See Section B1 through B4

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2. Additional Terms and Conditions

None.

B. Operational Restrictions

- 1. This emissions unit shall only be fired with natural gas or diesel fuel.
- 2. Annual natural gas usage in emissions units P001, P004, P019, P020, P023, P028, and P012 shall not exceed 330,000,000 cubic feet per rolling 12-months; and

Annual diesel fuel usage in reciprocating engines assembled at emissions units P012 and P028 shall not exceed 20,000 gallons per rolling 12-months.

- 3. The quality of the diesel fuel burned in this emissions unit shall meet the following specifications on an "as received" basis:
 - a. a sulfur content which is sufficient to comply with the allowable sulfur dioxide emission limitation of 0.5 pound sulfur dioxide/mmBtu actual heat input; and
 - b. greater than 130,000 Btu/gallon of diesel fuel.

Compliance with the above-mentioned specifications shall be determined by using monitoring and testing methods described Sections C and E of this permit.

- 3. To ensure enforceability during the first 12 calendar months of operation, the fuel usage in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012, and all reciprocating engines burning diesel fuel, including emissions units P028 and P012, shall not exceed the following fuel usage limits, as specified in the following table:

Month	Natural Gas (ft3)	Diesel fuel (gal)
1	27,500,000	1,667
2	55,000,000	3,333
3	82,500,000	5,000
4	110,000,000	6,666
5	137,500,000	8,333
6	165,000,000	10,000
7	192,500,000	11,666
8	220,000,000	13,333
9	247,500,000	15,000

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10	275,000,000	16,666
11	302,500,000	18,333
12	330,000,000	20,000

After the first twelve months, compliance shall be demonstrated by maintaining 12-month rolling records of fuel usage.

C. Monitoring and/or Recordkeeping Requirements

1. The facility shall install, maintain, and operate, in accordance with the manufacturers specifications, instrumentation sufficient to track all natural gas and oil usage for each engine and engine/compressor unit tested at this test stand during periods of operation. Records of natural gas and oil usage shall be maintained for each engine installed at the test stand, per Section C.3 below.
2. The facility shall maintain a record of the company identification of each reciprocating engine installed at this test stand, which would reference the engine size based on the heat input needed at peak load in MMBtu per hour and/or gigajoules per hour and the date each engine was installed and removed from the test stand.
3. The permittee shall maintain monthly records for emission units P001, P004, P019, P020, P023, P028, and P012 which include the following:
 - a. the total fuel burned, natural gas (ft³), diesel fuel (gallons), jet fuel (gallons), kerosene (gallons), and/or other petroleum distillate oils (gallons), summed for all turbine/compressor units and/or reciprocating engine/compressor units operated at each test stand during the month; and
 - b. the rolling, 12-month summation of each type of fuel used.
4. The permittee shall collect or require the oil supplier to collect a representative grab sample for each shipment of diesel fuel that is received for burning in this emissions unit. The permittee shall perform or require the supplier to perform the analyses for sulfur content and heat content in accordance with the following ASTM methods: ASTM method D4294, ASTM method D240, or ASTM method 6010 for sulfur content; and ASTM method D240 for heat content. Alternative, equivalent methods may be used upon written approval by the Ohio EPA Central District Office. For each shipment of diesel fuel received for burning in this emissions unit, the permittee shall maintain records of the total quantity of oil received and the permittee's or oil supplier's analyses for sulfur content and heat content.
5. With each shipment of diesel fuel received or with any change in the quality of natural gas received at the facility, the representative sulfur dioxide emission rate from fuels shall be calculated as specified in OAC rule 3745-18-04(F):

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- a. each shipment of diesel fuel received shall be tested for the sulfur content and heat content or the oil supplier's analyses shall be provided, and the records of testing results maintained, per Section C.4. Until stack testing is conducted, as per Section E.6, the SO₂ per MMBtu emissions shall be determined per OAC rule 3745-18-04(F)(2);
- b. for natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and
- c. for natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be determined per OAC rule 3745-18-04(F)(3).

D. Reporting Requirements

1. The permittee shall submit, on a quarterly basis, copies of the permittee's or oil supplier's analyses for each shipment of diesel fuel which is received for burning in this emissions unit. The permittee's or oil supplier's analyses shall document the sulfur content (percent) and heat content (Btu/gallon) for each shipment of diesel. The following information shall also be included with the copies of the permittee's or oil supplier's analyses:

- a. the total quantity of diesel fuel received in each shipment (gallons);
- b. the weighted* average sulfur dioxide emission rate (pounds/mmBtu) for the diesel fuel received during the calendar month; and
- c. the weighted* average heat content (Btu/gallon) of the diesel fuel received during the calendar month.

These quarterly reports shall be submitted by January 31, April 30, July 31, and October 31 of each year and shall cover the oil shipments received and fuel usage during the previous calendar quarters.

* In proportion to the quantity of diesel received in each shipment during the month

2. The permittee shall submit deviation (excursion) reports that identify all exceedances of the rolling 12-month fuel usage limitations and/or limits established for the first 12 calendar months of operation following issuance of this permit, as per Section B.4. These reports are due by the date described in Part

1 - General Terms and Conditions of this permit under Section A.2.

3. The permittee shall also submit annual reports which specify the total emissions and fuel usage from this emissions unit for the previous calendar year. The annual fuel usage and emissions report shall be submitted by January 31st of each year.

E. Testing Requirements

Compliance with the emission limitations contained in this permit shall be determined in accordance with the following methods:

1. Emission Limitation

0.062 pound PM per million Btu of actual heat input for large bore internal combustion engine
0.31 pound PM per million Btu of actual heat input for small bore internal combustion engine

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Applicable Compliance Method

Compliance shall be demonstrated by using the appropriate emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.4-2 and 3.2-2 (or other factors approved by the Ohio EPA), or if required, testing of the exhaust stack, using Methods 1 through 5, found in 40 CFR Part 60, Appendix A:

Pollutant	Emission Factor	Source of Factor
PM w/ diesel	0.062 lb PM/MM Btu	AP-42 Table 3.4-2
PM w/ natural gas	0.03 lb PM/MM Btu	AP-42 Table 3.2-2

2. Emission limitation

0.5 lb SO₂/mm Btu actual heat input

Applicable Compliance Method

Compliance shall be demonstrated by testing the sulfur content and heat content of each shipment of diesel fuel received and maintaining records of these testing results or the oil supplier's analyses, per Section C.4. Until stack testing is conducted, as per Section E.6, the SO₂ per MMBtu emissions shall be calculated per OAC rule 3745-18-04(F)(2) as follows:

$ER = (1 \times 10^6) / H \times D \times S \times 1.974$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the liquid fuel in Btu per gallon

D = the density of the liquid fuel in pounds per gallon; and

S = the decimal fraction of sulfur in the liquid fuel

For natural gas that has been documented (and maintained on record) to have a heat content greater than 950 Btu per standard cubic foot and a sulfur content less than 0.5 pound per million standard cubic feet, the sulfur dioxide emission rate shall be considered to be equal to and recorded as 0.0 pound of sulfur dioxide per MM Btu, per 3745-18-04(F)(4); and

For natural gas with a heat content equal to or less than 950 Btu per standard cubic foot and/or a sulfur content equal to or more than 0.6 pound per million standard cubic feet, the representative sulfur dioxide emission rate from any sample shall be calculated per OAC rule 3745-18-04(F)(3) as follows:

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$ER = (1 \times 10E6) / H \times D \times S \times 1.998$, where:

ER = emission rate in pounds of SO₂ per MM Btu

H = the heat content of the gaseous fuel in Btu per standard cubic foot

D = the density of the gaseous fuel in Btu per standard cubic foot; and

S = the decimal fraction of sulfur in the gaseous fuel

3. Emission limitation

Visible particulate emissions shall not exceed 20% opacity as a six-minute average, except as provided by rule.

Compliance Method

Compliance shall be determined through visible emissions observations performed in accordance with 40 CFR Part 60, Appendix A, Method 9 and the procedures specified in OAC 3745-17-03(B)(1).

4. Rolling 12-month emission limitations when burning natural gas in all turbines and reciprocating engine(s) burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012

86.91 tons NO_x per rolling 12 months;
29.78 tons CO per rolling 12 months;
4.70 tons VOC per rolling 12 months;
3.14 ton PM per rolling 12 months; and
0.11 ton SO₂ per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of natural gas in all turbines and reciprocating engines burning natural gas, including emissions units P001, P004, P019, P020, P023, P028, and P012 shall be demonstrated through the monthly recordkeeping of the natural gas consumed in all turbines and reciprocating engine(s) using natural gas, and adding the rolling 12-month total natural gas usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Tables 3.1-1 and 3.2-2 dated 10/96, or other factors derived from testing and approved by the Ohio EPA Central District Office:

Reciprocating Engines:

Pollutant	Emission Factor	Source of Factor
NO _x w/ natural gas	1.00 lb/MM Btu	Facility testing Results

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CO w/ natural gas	1.20 lb/MM Btu	Facility testing Results
VOC w/ natural gas	0.50 lb/MM Btu	Facility testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SOx w/ natural gas	0.0007 lb/MM Btu	Facility testing Results

Turbines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas using RB211 turbine	1.08 lb/MM Btu	Facility Testing Results (see Section E.8)
NOx w/ natural gas using RB211 turbine with *DLE	0.11 lb/MM Btu	Facility Testing Results (see Section E.8)
NOx w/ natural gas using Avon or Allison turbine	0.46 lb/MM Btu	Facility Testing Results (see Section E.8)
CO w/ natural gas	0.19 lb/MM Btu	Facility Testing Results
VOC w/ natural gas	0.03 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.02 lb/MM Btu	AP-42 Table 3.1-1
SOx w/ natural gas	0.0007 lb/MM Btu	AP-42 Table 3.1-1

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

* DLE="Dry Low Emission"-new control technology

5. Rolling 12-month emission limits from diesel fuel combustion in all facility reciprocating engines installed in test stands P028 and P012

5.85 tons NOx per rolling 12 months;
1.56 tons CO per rolling 12 months;
2.17 tons VOC per rolling 12 months;
0.08 ton PM per rolling 12 months; and
0.65 tons SO2 per rolling 12 months

Applicable Compliance Method

Compliance with the annual 12-month rolling emissions from the combustion of diesel fuel in all reciprocating engines, including emissions units P028, and P012,-shall be demonstrated through the monthly recordkeeping of the total diesel fuel consumed in all reciprocating engines using these fuels, and adding the rolling 12-month total diesel fuel usage each month. Emissions shall be calculated using the following worst case emission factors from facility test data and from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.4-2 dated 10/96

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or other factors derived from future testing and approved by the Ohio EPA Central District Office:

Reciprocating Engine:

Pollutant	Emission Factor	Source of Factor
NOx w/ diesel	4.50 lb/MM Btu	Facility testing Results
CO w/ diesel	1.20 lb/MM Btu	Facility testing Results
VOC w/ diesel	1.67 lb/MM Btu	Facility testing Results
PM w/ diesel	0.062 lb/MM Btu	AP-42 Table 3.4-2
SOx w/ diesel	0.50 lb/MM Btu	Limit from 3745-18-06(G)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

6. Hourly emission limits when using diesel fuel

47.52 lbs NO_x/hr;
12.67 lbs CO/hr;
17.64 lbs VOC/hr;
0.65 lbs PM/hr; and
5.28 lbs SO₂/hr

Applicable Compliance Method

Until testing has been completed, compliance with the hourly emission limits from the combustion of diesel fuel in the testing of any reciprocating engine installed at this test stand shall be demonstrated through the calculation of emissions from the largest fuel capacity engine that could be installed at this test stand and recordkeeping of the fuel consumed per hour. Emissions shall be calculated using the following emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.4-2 dated 10/96 or other factors derived from testing and approved by the Ohio EPA Central District Office:

Reciprocating Engines

Pollutant	Emission Factor	Source of Factor
NO _x w/ diesel	4.50 lb/MM Btu	Facility Testing Results (see Section E.6)
CO w/ diesel	1.20 lb/MM Btu	Facility Testing Results (see Section E.6)
VOC w/ diesel	1.67 lb/MM Btu	Facility Testing Results
PM w/ diesel	0.062 lb/MM Btu	AP-42 Table 3.4-2
SO _x w/ diesel	0.50 lb/MM Btu	Limit from 3745-18-06(G) (see section C.4)

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

7. Hourly Emission Limit when using natural gas

24.4 lbs NO_x/hr;
29.28 lbs CO/hr;
12.20 lbs VOC/hr;
0.732 lbs PM/hr; and
0.017 lb SO₂/hr

Applicable Compliance Method

Until testing has been completed, compliance with the hourly emission limits from the combustion of natural gas in the testing of any reciprocating engine installed at this test stand shall be demonstrated through the calculation of emissions from the largest fuel capacity engine that could

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be installed at this test stand and recordkeeping of the maximum fuel consumed per hour. Emissions shall be calculated using the following emission factors from "Compilation of Air Pollutant Emission Factors", Fifth Edition (AP-42) Table 3.2-2 dated 10/96 or other factors derived from testing and approved by the Ohio EPA Central District Office:

Reciprocating Engines:

Pollutant	Emission Factor	Source of Factor
NOx w/ natural gas	1.00 lb/MM Btu	Facility Testing Results (see Section E.6)
CO w/ natural gas	1.20 lb/MM Btu	Facility Testing Results (see Section E.6)
VOC w/ natural gas	0.50 lb/MM Btu	Facility Testing Results
PM w/ natural gas	0.03 lb/MM Btu	AP-42 Table 3.2-2
SOx w/ natural gas	0.0007 lb/MM Btu	Facility Testing Results

These emission factors shall be multiplied by the heat input (MM Btu) to obtain the emission rate.

8. Emission Limitation

47.52 lbs NOx/hr when using diesel fuel;
12.67 lbs CO/hr when using diesel fuel;
24.40 lbs NOx/hr when using natural gas; and
29.28 lbs CO/hr when using natural gas

Applicable Compliance Method

The permittee shall conduct, or have conducted, emission testing for this emissions unit in accordance with the following requirements:

- a. emission testing shall be conducted one time during the term of this permit and within 6 months after issuance of the permit;
- b. emission testing shall be conducted to demonstrate compliance with the hourly allowable mass emission rate of nitrogen oxides and carbon monoxide;
- c. the following test methods shall be employed to demonstrate compliance with the allowable mass emission rates:

40 CFR Part 60, Appendix A, Methods 1 through 4, Method 7, Method 10, and Method 9

Alternative U.S. EPA approved test methods may be used with prior approval from the

Rolls

PTI A

Emissions Unit ID: **P012**

To be entered upon final issuance

Ohio EPA.

- d. tests shall be conducted using the largest reciprocating engines installed at the time testing is scheduled, at either P012 or P028, and using each fuel type;
- e. testing shall be conducted while the emissions unit is operating at its maximum capacity, unless otherwise specified or approved by the Ohio EPA Central District Office;
- f. not later than 30 days prior to the proposed test date(s), the permittee shall submit an "Intent to Test" notification to the Ohio EPA Central District Office. The "Intent to Test" notification shall describe in detail the proposed test methods and procedures, the emissions unit operating parameters, the time(s) and date(s) of the tests, and the person(s) who will be conducting the tests. Failure to submit such notification for review and approval prior to the tests may result in the Ohio EPA Central District Office's refusal to accept the results of the emission tests;
- g. personnel from the Ohio EPA Central District Office shall be permitted to witness the tests, examine the testing equipment, and acquire data and information necessary to ensure that the operation of the emissions unit and the testing procedures provide a valid characterization of the emissions from the emissions unit and/or the performance of the control equipment; and
- h. a comprehensive written report on the results of the emissions tests shall be signed by the person or persons responsible for the tests and submitted to the Ohio EPA Central District Office within 30 days following completion of the tests. The permittee may request additional time for the submittal of the written report, where warranted, with prior approval from the Ohio EPA Central District Office.

F. Miscellaneous Requirements

None.