

VENTURA COUNTY AIR POLLUTION CONTROL DISTRICT

RULE 74.23 - STATIONARY GAS TURBINES

(Adopted 3/14/95, Revised 10/10/95, 6/12/01, 1/8/02, 11/12/19, XX/XX/24)

A. Applicability

This rule shall apply to all stationary gas turbines with a rated output of 0.3 megawatt (MW) or greater and operated on gaseous and/or liquid fuel.

B. Requirements

~~1. On or before December 31, 2023, no person shall discharge into the atmosphere from any stationary gas turbine emissions in excess of the following:~~

~~Unit NOx Emissions (ppmv*)
Rating (MW) Gaseous Fuel Liquid Fuel~~

~~0.3 to <2.9 42 65
2.9 to <10.0 25 x E/25 65~~

~~10.0 and up, 9 x E/25 25 x E/25
With SCR~~

~~10.0 and up, 15 x E/25 42 x E/25
Without SCR~~

~~4.0 and up, less 42 65
than 877 hours per
calendar year~~

~~*NOx and ammonia concentrations are corrected to 15 percent oxygen on a dry basis~~

~~Turbine efficiency (E) shall be determined as follows:~~

$$\del E = \frac{\text{(MRE [Continuous] at LHV)(LHV)}}{\text{(HHV)}}$$

~~Where: LHV = the lower heating value of the fuel~~

~~HHV = the higher heating value of the fuel~~

~~MRE = manufacturer's rated thermal efficiency~~

~~Turbine efficiency (E) shall not be less than 25 percent; a turbine with an efficiency lower than 25 percent shall be assigned an efficiency of 25 percent for the purposes of this rule.~~

- ~~2. On or before December 31, 2023, no person shall discharge into the atmosphere from any emission control device installed and operated pursuant to the requirements of Subsection B.1 above, ammonia (NH₃) emissions in excess of 20 ppmv.~~
31. ~~On and after January 1, 2024, n~~No person shall discharge into the atmosphere from any stationary gas turbine, nitrogen oxides (NOx) emissions in excess of the following: concentration limits specified in Table 1. For stationary gas turbines with Selective Catalytic Reduction (SCR) systems installed and operated, ammonia (NH₃) emissions must not exceed the concentration limits specified in Table 1.

Table 1. Emission Concentration Limits

Fuel Type	NOx (ppmv*)	Ammonia (ppmv*)
Liquid Fuel	30	10
Natural Gas	2.5	10
Digester Gas	9	10

*NOx and ammonia concentrations are corrected to 15 percent oxygen on a dry basis

42. All ~~F~~turbines shall verify compliance with emission limits annually and, if using applicable test methods in Section F. Additionally, Ffor turbines equipped with continuous emission monitoring (CEMS) equipment, the owner or operator shall perform a Relative Accuracy Test Audit (RATA) annually and use CEMS data to verify compliance. -Ammonia testing is only required for units controlled by Selective Catalytic Reduction (SCR).
53. The owner or operator of any stationary gas turbine shall install, operate, and maintain in calibration, equipment, that continuously measures, records and satisfies the following:
- a. Control system operating parameters,
 - b. Elapsed time of operation,
 - c. If no CEMS is present, the owner or operator shall provide documentation and perform ~~certified bi~~ annual certified source tests, correlating the control system operating parameters to the associated measured NOx emissions. -This information may be used by a regulatory agency to determine compliance when no continuous NOx emission monitoring

system exists or when the continuous emission monitoring system is not operating properly,

- d. ~~For units with a rated output of 10 MW and over, that operated an average of more than 4000 hours per calendar year prior to May 31, 1995~~If CEMS is present, continuous exhaust gas NO_x concentrations corrected to 15 percent oxygen on a dry basis and averaged over any three consecutive hours. The continuous NO_x emission monitor shall meet the requirements specified in Rule 103, Stack Monitoring - Continuous Monitoring Systems, and
 - e. Equipment is approved by the Air Pollution Control Officer (APCO).
6. ~~The owner or operator of any stationary gas turbine shall submit for approval to the APCO a plan for compliance with the provisions of Subsection B.3 by January 1, 2021. The plan shall include:~~
 - a. ~~A list of all units subject to the rule, including the manufacturer, model number, rated shaft power output (MW), electrical generator efficiency, fuel type, fuel HHV, fuel consumption rate (MCF/Hr or gal/Hr), and heat rate (BTU/kw-Hr, corrected to HHV) of the turbine, and~~
 - b. ~~A description of the NO_x control system proposed for each unit, including type and manufacturer, as well as a description of any ancillary equipment related to the control of emissions, including the measurement and recording equipment required in Subsection B.5. Data on the expected performance of the NO_x control system shall also be included, and~~
 - c. ~~A compliance schedule for each unit, including, but not limited to, specific dates for the following events: final engineering, contract award, begin construction, complete construction, and final compliance, or~~
 - d. ~~An alternative means of producing equivalent emission reductions at an equal or lesser dollar amount per ton reduced at the facilities site or nearby community, upon approval of the Air Pollution Control Officer (APCO). This option is only available for units that shall meet the requirements for Best Available Retrofit Control Technology and has demonstrated to the approval of the APCO, that the cost of compliance exceeds the established cost effectiveness threshold of the District.~~
 7. ~~Notwithstanding the NO_x limit in Subsection B.1 and B.3, the owner or operator of a unit subject to Subsection B.6.d with a rated output of 20 MW or greater and equipped with water injection only, and where exhaust gases are used to dry paper, shall meet a 24 ppmv NO_x limit on gaseous fuel.~~
 8. ~~Notwithstanding the NO_x and ammonia limits in Subsection B.3, the owner or operator of a unit with a rated output of 4.0 MW, and in operation on an oil platform~~

~~located in Outer Continental Shelf (OCS) territory, and when the load is equal to or less than 30%, shall meet a 5 ppmv NOx and a 20 ppmv ammonia limits for gaseous fuel.~~

94. ~~On and after January 1, 2024, notwithstanding~~ Notwithstanding the NOx limits in Subsection B.31, the owner or operator of a unit with a rated output of 29 MW or greater and is equipped with steam injection and an SCR, and where exhaust gas is used in the manufacturing of corrugating medium, shall meet a 5 ppmv NOx limit on gaseous fuel.

~~10. Increments of Progress for Units Coming into Compliance with NOx and Ammonia Limits (Subsection B.3 and B.9):~~

~~a. Apply for an Authority to Construct before July 1, 2022.~~

~~b. Initiate construction or equipment installation or modification before January 1, 2023.~~

~~c. Demonstrate compliance via emission source test before January 1, 2024.~~

C. Exemptions

1. The provisions of Section B of this rule shall not apply to turbines operated under the following conditions:

- a. Laboratory units used in research and testing for the advancement of gas turbine technology.
- b. Units operated exclusively for fire fighting and/or flood control.
- c. Units operated less than 200 hours per calendar year.
- d. Emergency standby units operated during either an emergency or maintenance operation. Maintenance operation is limited to 104 hours per calendar year and emergency operation is limited to 200 hours per calendar year and only in the event of force majeure emergency.

~~2. e. NOx emission limits specified in Subsection B.1 of this rule shall not apply.~~ d. During the thermal stabilization period associated with a start-up, planned shutdown or unplanned load change as follows:

~~a. (1)~~ a. (1) — A start-up ~~exemption period~~ shall not exceed two (2) hours for units utilizing steam injection and one (1) hour for all other units.

~~b. (2)~~ b. (2) — A planned shutdown ~~exemption period~~ shall not exceed one (1) hour.

c. ~~(3)~~—An unplanned load change ~~exemption period~~ shall not exceed two (2) hours for units utilizing steam injection and one (1) hour for all other units.

d. The emission control system shall be in operation and emissions shall be minimized insofar as technologically feasible during start-up, planned shutdown or unplanned load change. -During these periods, NOx emissions shall not exceed 100 ppmv at 15 percent oxygen, averaged over the duration of the thermal stabilization period.

For failed start-ups, each restart shall begin a new exemption period.

23. In lieu of Subsection C.1.e2 above, ~~the provisions of NOx emission limits specified in Subsection B.1~~ of this rule shall not apply during the thermal stabilization period associated with a start-up, planned shutdown or unplanned load change on turbines rated at over 20 MW equipped with selective catalytic reduction and a waste heat steam generator, fueled by natural gas, and where steam is used to dry paper, as follows:

a. A cold start-up ~~exemption period~~ shall not exceed twelve (12) hours.

b. A normal start-up ~~exemption period~~ shall not exceed three (3) hours.

c. A planned shutdown ~~exemption period~~ shall not exceed one (1) hour.

d. An unplanned load change ~~exemption period~~ shall not exceed two (2) hours.

e. The emission control system shall be in operation and emissions shall be minimized insofar as technologically feasible during start-up, planned shutdown or unplanned load change. During these periods, NOx emissions shall not exceed 100 ppmv at 15 percent oxygen, averaged over the duration of the thermal stabilization period.

For failed start-ups, each restart shall begin a new exemption period.

D. Recordkeeping Requirements

1. The owner or operator of a unit subject to the provisions of Section B of this rule shall maintain the continuous records specified in Subsection B.53 for a period of 5 years. The records shall be available for inspection by the District upon request.

2. The owner or operator of a unit exempt from the provisions of Section B of this rule, as specified in either Subsection C.1.c or C.1.d, shall install a non-resettable totalizing hour meter and shall maintain monthly records of total operating hours for a period of 5 years after the date of each entry. The records shall be available for inspection by the District upon request.

3. Any person utilizing the start-up, planned shutdown or unplanned load change exemption pursuant to Subsection C.2 or C.3 of this rule, shall maintain records of the start-up dates, times, durations, and type and quantity of the fuel used.

E. Reporting Requirements

1. Prior to each permit renewal, each operator subject to the provisions of this rule shall provide the District with data specifying the actual annual usage (e.g., fuel consumption, operating hours, etc.) of each applicable turbine. Also required is the annual compliance verification as specified in Subsection B.42.

2. Any person operating pursuant to Rule 74.23 shall submit to the District all records generated during each calendar year by December 31st of the following calendar year.

F. Test Methods

1. Oxides of nitrogen emissions for compliance source tests shall be determined by using EPA Method 20, Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions From Stationary Gas Turbines. The average of three runs shall be used to determine compliance.

2. Oxygen content for compliance source tests shall be determined by using ARB Method 100, Procedures for Continuous Gaseous Emission Stack Sampling.

3. NOx emission limitations specified in Subsections B.1-and B.3, C.2.d, and C.3.e are expressed as nitrogen dioxide. All emission limitations are referenced at 15 percent volume stack gas oxygen measured on a dry basis.

4. The heating value of fuel oil shall be measured using ASTM Method D-240-~~1792~~, Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter, approved in April 1997. The heating value of gaseous fuel shall be measured using ASTM Method D-1945-~~1403~~, Standard Method for Analysis of Natural Gas by Gas Chromatography, approved in January 2010.

5. Ammonia emissions shall be determined using Bay Area Air Quality Management District Method ST-1B, Ammonia Integrated Sampling, dated 1/20/82. The average of three runs shall be used to determine compliance.

6. Relative Accuracy Test Audits (RATA) shall be conducted annually for all units with continuous Emissions Monitoring Equipment (CEMS) installed in accordance with 40 CFR 60 Appendix F requirements.

G. Violations

1. Failure to comply with any provision of this Rule shall constitute a violation of this rule.

2. It is the responsibility of the turbine operator to demonstrate to the satisfaction of the Air Pollution Control Officer that a unit subject to the provisions of this rule is being operated in continuous compliance with all applicable provisions of this rule.
3. The owner or operator of a unit subject to the provisions of Subsection B.1, or exempt according to Subsection C.1.c, shall notify the APCO within seven days if the limit on annual operating hours is exceeded. Once the limit is exceeded, the exemption shall be permanently withdrawn. Within 30 days of the exceedance, the owner or operator shall apply for an Authority to Construct to install control equipment sufficient to meet applicable emission limits. The owner or operator must demonstrate compliance with the rule within 24 months. Operating hours that occur during a force majeure emergency shall be excluded from the annual total.

H. Definitions

1. "Best Available Retrofit Control Technology" or "BARCT": An emission limitation that is based on the maximum degree of reduction achievable taking into account environmental, energy, and economic impacts by each class or category of source (Health & Safety Code Section 40406).
2. "Cold start-up": A start-up that occurs after the unit has experienced zero fuel flow for a period of twenty-four (24) hours or more.
3. "Control System Operating Parameters": the operating parameters necessary for analysis when determining compliance. Parameters may include, but are not limited to, ammonia and exhaust gas flow rates, exhaust gas temperature, humidity, water or steam injection rate, and fuel use.
4. "Emergency Standby Unit": a unit used only when normal power line or natural gas service fails. Electricity generated by such a unit cannot be sold.
5. "Force Majeure Emergency": an unforeseeable event not resulting from an intentional or negligent act or omission on the part of the owner or operator, or a natural disaster. Such events include, but are not limited to, loss of major generating resources or transmission capability, flood, earthquake, storm, fire, lightning, or other natural catastrophes.
6. "Maintenance Operation": The use of an emergency standby turbine and fuel system during testing, repair and routine maintenance to verify its readiness for emergency standby use.
7. "Normal start-up": A start-up that occurs when the unit is not considered cold.
8. "Outer Continental Shelf Area (OCS)": "Outer Continental Shelf Area" means any offshore waters for which the District has been designated the corresponding

onshore area by the U.S. Environmental Protection Agency, Anacapa Island, and San Nicolas Island.

9. "Planned Shutdown": a premeditated shutdown not caused by automatic sensors or other instrumentation.
10. "Power Augmentation": an increase in the gas turbine shaft output and/or the decrease in gas turbine fuel consumption by the addition of energy recovered from exhaust heat. Energy recovered from exhaust heat includes, but is not limited to, the use of regenerators, intercoolers, and steam injection. -Also included is water injection.
11. "Rating": the continuous megawatt (MW) output or the mechanical equivalent as established by the manufacturer without power augmentation.
12. "Start-up": The process of bringing an applicable unit and its associated emission control device up to operating temperature.
13. "TPY": Tons per year.
14. "Turbine" or "Unit": any gas turbine system with or without power augmentation, either attached to a foundation or operated at a site for more than one year. Two or more gas turbines powering one shaft shall be treated as one unit.
15. "Unplanned Load Change": the automatic release of power from the turbine and the subsequent restart. Loss of power during the release must exceed 40 percent of the turbine rating.