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, XX/XX/19)

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, ~~N~~no person shall discharge into the atmosphere from any stationary gas turbine emissions in excess of the following:

Unit Rating (MW)	NOx Emissions (ppmv*) 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, With SCR	9 x E/25	25 x E/25
10.0 and up, Without SCR	15 x E/25	42 x E/25
4.0 and up, less than 877 hours per calendar year	42	65

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

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

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

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._

~~All Turbines shall verify compliance annually.~~

~~2. The owner or operator of any stationary gas turbine shall install, operate, and maintain in calibration, equipment, as approved by the Air Pollution Control Officer (APCO), that continuously measures and records the following:~~

~~a. Control System Operating Parameters,~~

~~b. Elapsed time of operation, and~~

~~c. For units 10 MW and over that operated an average of more than 4000 hours per calendar year prior to May 31, 1995, continuous exhaust gas NOx concentrations corrected to 15 percent oxygen on a dry basis and averaged over any three consecutive hours. The continuous NOx emission monitor shall meet the requirements specified in Rule 103, Stack Monitoring.~~

~~The owner or operator shall provide documentation, including a certified source test, correlating the Control System Operating Parameters to the associated measured NOx emissions. This information may be used by the District to determine compliance when no continuous NOx emission monitoring system exists or when the continuous emission monitoring system is not operating properly.~~

~~3. The owner or operator of any stationary gas turbine shall submit for approval to the APCO a plan for compliance with the provisions of Subsections B.1. 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.~~

~~b. A description of the NOx 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.2. Data on the expected performance of the NOx control system shall also be included.~~

~~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.~~

~~4~~2. On or before December 31, 2023, ~~No~~ 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 (NH_3) emissions in excess of 20 ppmv.

3. On and after January 1, 2024, no person shall discharge into the atmosphere from any stationary gas turbine, emissions in excess of the following:

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

4. All Turbines shall verify compliance with emission limits annually and, if equipped with continuous emission monitoring (CEMS) equipment shall perform a Relative Accuracy Test Audit (RATA) annually. Ammonia testing is only required for units controlled by Selective Catalytic Reduction (SCR).

5. 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, continuous exhaust gas NOx concentrations corrected to 15 percent oxygen on a dry basis and averaged over any three consecutive hours. The

continuous NOx emission monitor shall meet the requirements specified in Rule 103, Stack Monitoring, 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 NOx 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 NOx 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.

74. Notwithstanding the NOx limit in Subsection B.1 and B.3, the owner or operator of a unit subject to Subsection B.6.d ~~rated at~~ with a rated output of~~over~~ 20 MW or greater and equipped with water injection only, and where exhaust gases are used to dry paper, shall meet a 24 ppmv NOx limit on gaseous fuel ~~or a 57 ppmv NOx limit on liquid fuel~~.

8. Notwithstanding the NOx 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.

9. On and after January 1, 2024, notwithstanding the NOx limits in Subsection B.3, 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.

~~9~~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.

~~6. Notwithstanding the NOx limit in Subsection B.1, the owner or operator of a unit rated at over 39 MW and equipped with steam injection and SCR, and where exhaust gases are used to dry paper, shall meet a 6.8 ppmv NOx limit on gaseous fuel.~~

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.

e. During the thermal stabilization period associated with a start-up, planned shutdown or unplanned load change as follows:

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

(2) A planned shutdown exemption shall not exceed one (1) hour.

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

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

2. In lieu of Subsection C.1.e above, the provisions of Section B 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, and where steam is used to dry paper, as follows:

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

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

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

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

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.~~2~~5 for a period of 5~~2~~ 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~~2~~ years after the date of each entry. The records shall be available for inspection by the District upon request.

E. Reporting Requirements

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.4~~1~~.

F. Test Methods

1. Oxides of nitrogen emissions for compliance source tests shall be determined by using EPA Method 20. 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.

3. NOx emission limitations specified in Subsection B.1 and B.3 are expressed as nitrogen dioxide. All emission limitations are referenced at ~~fifteen (~~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-~~87~~17. The heating value of gaseous fuel shall be measured using ASTM Method D ~~1826-88~~1945-14.

5. Ammonia emissions shall be determined using Bay Area Air Quality Management District Method ST-1B, 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 ~~submit a plan as specified in Subsection B.3 to show~~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).

~~1~~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~~2~~. "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~~3~~. "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.

~~4.~~ 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~~5~~. "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~~6~~. "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.

7~~9~~. "Planned Shutdown": a premeditated shutdown not caused by automatic sensors or other instrumentation.

10~~8~~. "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~~9~~. "Rating": the continuous megawatt (MW) output or the mechanical equivalent as established by the manufacturer without power augmentation.

120. "Start-up": The process of bringing an applicable unit and its associated emission control device up to operating temperature.

13. “TPY”: Tons per year.

141. "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.

152. "Unplanned Load Change": the automatic release of power from the turbine and the subsequent restart. Loss of power during the release must exceed forty (40) percent of the turbine rating.