

RULE 68. FUEL-BURNING EQUIPMENT - OXIDES OF NITROGEN
(Effective 7/1/71: Rev. Effective 9/20/94)

(a) **APPLICABILITY**

Except as provided in Section (b), this rule is applicable to any non-vehicular, fuel-burning equipment which has a maximum heat input rating of 50 million British Thermal Units (Btu) (12.6×10^6 kcal) per hour (gross) or more.

(b) **EXEMPTIONS**

The provisions of this rule shall not apply to:

- (1) Any article, machine, equipment, facility, or other contrivance used exclusively for the testing of turbine engines or their components.
- (2) Any equipment or other contrivance used exclusively for the processing and combustion of municipal solid waste provided that emissions of nitrogen oxides (NO_x), calculated as nitrogen dioxide (NO₂) at three percent oxygen (O₂) on a dry basis, meet the requirements of Lowest Achievable Emission Rate (LAER) as defined in Rule 20.1.
- (3) Turbine engines during a continuous 30-minute period for startup, a continuous 30-minute period for shutdown and a continuous 30-minute period during a fuel change.
- (4) Diesel-fired internal combustion engines at nuclear generating stations when used only for safety compliance testing of emergency electrical power generation as required by the Nuclear Regulatory Commission.
- (5) Boiler-steam turbine generator sets installed prior to January 1, 1966, with a maximum heat input of 2200 million Btu per hour or less, during startup, fuel change, low load, or pre- or post-overhaul tests, provided that their operation conforms to an operating condition described in Table 1 and that NO_x emissions concentration does not exceed an applicable exemption limit specified in Table 1.

Compliance with exemption limits specified in Table 1 shall be determined by the method described in Section (g).

It is the responsibility of any person claiming an exemption, pursuant to Subsection (b)(5), to maintain records in accordance with Section (e) of this rule.

Table 1 - Exemption Limits

	<u>Maximum Gross Heat Input Rate (Million Btu Per Hour)</u>			
	Less than 1200		1200 to 2200	
	Exemption Limit (ppm)	Maximum Number of Allowable Exceedances (Clock-Hours)	Exemption Limit (ppm)	Maximum Number of Allowable Exceedances (Clock-Hours)
Operating Condition:				
Cold Startup (Gas)	175	8	250	8
Cool Startup (Gas)	175	5	250	5
Warm Startup (Gas)	175	3	200	3
Hot Startup (Gas)	175	2	200	2
Fuel Change *	225	no maximum	250	1
Low Load (Gas)	125	no maximum	175	no maximum
Low Load (Liquid)	225	no maximum	300	no maximum
Overhaul Test (Gas)**	125	no maximum	200	3

* For the purposes of this Subsection, a fuel change shall be considered a liquid fuel operation.

** The exemption limit for "Overhaul Test" shall not be used more than two times per calendar year per each boiler-steam turbine generator set.

(c) DEFINITIONS

For the purposes of this rule, the following definitions shall apply:

(1) **"Boiler"** means any combustion equipment, excluding gas turbines, fired with liquid, gaseous and/or solid fuel and used to produce steam or to heat water. A duct burner/heat exchanger combination installed in the exhaust duct of a gas turbine or internal combustion engine shall not be considered a boiler.

(2) **"Boiler Steam-Turbine Generator Set"** means any combination of equipment consisting of a boiler used to produce steam to be expanded in a turbine generator for the generation of electric power.

(3) **"Clock-Hour"** means every 60-minute period starting on the hour.

(4) **"Cold Startup"** means that, in a boiler-steam turbine generator set, the initial steam turbine metal temperature is less than 300°F (149°C).

(5) **"Cool Startup"** means that in a boiler-steam turbine generator set, the initial steam turbine metal temperature is greater than 300°F (149°C).

(6) **"Exemption Limit"** means the maximum, allowable concentration of oxides of nitrogen, by volume, specified in Table 1, and expressed as nitrogen dioxide, calculated at three percent oxygen on a dry basis.

(7) **"Exceedance"** means an occurrence when the average clock-hour NOx emissions concentration is greater than a NOx emissions limit specified in Section (d). Such an exceedance may qualify for compliance with the exemption limits specified in Subsection (b)(5).

(8) **"Fuel Change"** means a transitory period when a switch occurs between oil, gas or any combination of liquid or gaseous fuels.

(9) **"Hot Startup"** means that, in a boiler-steam generator turbine generator set, the initial steam turbine metal temperature is greater than 800°F (427°C).

(10) **"Low Load"** means boiler operation at less than 25 percent of rated capacity, when not performing an overhaul test.

(11) **"Municipal Solid Waste"** means solid waste disposable in a Class II landfill pursuant to Section 2520 of Title 23 of the California Code of Regulations.

(12) **"Overhaul Test"** means testing of turbine-control and protective devices, which are conducted at varying load conditions. Nothing in this rule shall be construed to limit the number, type or load conditions of overhaul tests conducted in compliance with the emission limits of Section (d).

(13) **"Warm Startup"** means that, in a boiler-steam turbine generator set, the initial steam turbine metal temperature is greater than 600°F (316°C).

(d) **STANDARDS**

Emissions of nitrogen oxides, from any non-vehicular fuel burning equipment subject to this rule, calculated as nitrogen dioxide at three percent oxygen on a dry basis, shall not exceed the following levels:

<u>Type of Fuel</u>	<u>Nitrogen Oxides, Concentration</u>	
	<u>Volume</u> <u>(parts per million [ppm])</u>	<u>Mass</u> <u>(mg/m³, at [20°C])</u>
(i) Gaseous	125	240
(ii) Liquid or Solid	225	430

When more than one type of fuel is used, the allowable NOx concentration shall be determined by proportioning the gross heat input for each fuel to its respective allowable concentration.

(e) **RECORDKEEPING REQUIREMENTS**

(1) When continuous emission monitors are installed on equipment subject to the provisions of this rule, pursuant to Rule 19.2, the operator shall record, at a minimum, the following information:

- (i) Unit identification
- (ii) Time of measurement
- (iii) Fuel type burned
- (iv) Measured oxygen level (%)
- (v) Uncorrected NO_x emission concentration (ppm) at the measured oxygen level
- (vi) Corrected NO_x emission concentration (ppm) at 3% O₂

(2) Notwithstanding provisions of subsection (e)(1), fuel-burning equipment subject to the requirements of 40 CFR 75 (Continuous Emission Monitoring) shall comply with all applicable provisions of that regulation.

(3) When a boiler-steam turbine generator set is operating under the criteria of Subsection (b)(5), the following information, at a minimum, shall be recorded:

- (i) Unit identification
- (ii) Heat input or calculated heat input (Btu/hr)
- (iii) Operating conditions as specified in Table 1 and defined in Section (c)
- (iv) Operating condition start and finish times and date(s)
- (v) Duration of the operating condition
- (vi) Initial steam turbine metal temperature (°F or °C)
- (vii) Unit load (megawatts)
- (viii) Fuel type burned at start of operating condition
- (ix) Fuel type burned at end of operating condition
- (x) Total time each fuel type was burned during operating condition

- (xi) Measured oxygen level (%)
- (xii) Uncorrected NO_x emission concentration (ppm) at the measured oxygen level
- (xiii) Each clock-hour emission concentration (ppm) over the duration of the operating condition, corrected to 3% O₂
- (xiv) Average of all clock-hour emission concentrations (ppm) over the duration of the operating condition, corrected to 3% O₂

(4) The owner or operator of any unit exempt from the requirements of this rule, pursuant to Subsection (b)(3), shall maintain records of the hours of operation during the operating conditions described therein.

(5) The owner or operator of any unit subject to this rule shall maintain all records required by Section (e) for a minimum of three years. These records shall be maintained on the premises and made available to the District upon request.

(f) TEST METHODS

(1) Measurement of the average NO_x emissions concentration subject to Section (d) shall be conducted in accordance with District Method 7 or 20, as approved by EPA, or ARB Method 100, as approved by EPA, or with continuous emission monitors which are installed on equipment pursuant to District Rule 19.2, or to 40 CFR 75, as applicable. An exceedance detected by any of the methods described above shall be considered a violation of this rule.

(2) When District Method 7 or 20, or ARB Test Method 100 is used to determine compliance with Section (d), the averaging period to calculate the average NO_x emissions concentration shall be any sixty consecutive minute period.

(3) When continuous emissions monitors are installed on equipment pursuant to Rule 19.2 or to 40 CFR 75, as applicable, and are used to determine compliance with Section (d), the averaging period to calculate the average NO_x emissions concentration shall be every clock-hour. The average NO_x emissions concentration shall be computed from four or more data points equally spaced over the clock-hour.

(4) Measurements of emissions concentrations shall not include calibration or span check measurements of the emissions testing equipment.

(5) As specified in Subsection (b)(5) and defined in Section (c), startup conditions shall be determined by using pre-calibrated thermocouples to measure the initial steam turbine metal temperature at the first stage of the steam turbine. Other methods to measure

this temperature can be used provided that they are approved in advance by the Air Pollution Control Officer and the Environmental Protection Agency.

(6) A source test protocol shall be submitted prior to testing, and approved in writing by the Air Pollution Control Officer.

(g) PROCEDURE FOR COMPLIANCE DETERMINATION WITH THE EXEMPTION LIMITS IN TABLE 1

The following procedure shall be used to determine compliance with the exemption limits specified in Subsection (b)(5), Table 1:

(1) Determine if boiler-steam turbine generator set operation conforms to an operating condition specified in Table 1.

(2) Determine the average NO_x emissions concentration, C_{av}, over such operating condition using the following equation:

$$C_{av} = \frac{\sum_{i=1}^n C_i}{n} = \frac{C_1 + C_2 + \dots + C_n}{n}$$

where,

C_i = the actual clock-hour NO_x emissions concentration which was an exceedance of the standards specified in Section (d) during an operating condition specified in Table 1.

1 = the first clock-hour during the operating condition when an exceedance of the standards specified in Section (d) occurred; and

n = the actual number of clock-hours during the operating condition when an exceedance of the standards specified in Section (d) occurred. "n" shall not be greater than the maximum number of allowable exceedances of the standards of Section (d) as specified in Table 1, and shall be in chronological order following C₁.

(3) Compare C_{av} to the exemption limit corresponding to the operating condition specified in Table 1. If C_{av} is less than or equal to the exemption limit in Table 1, then the operation is in compliance with the exemption limits specified in Subsection (b)(5).