

(Adopted March 12, 1984)(Amended Dec. 7, 1984)((Invalidated Jan. 9, 1985)
(Adopted November 1, 1985)(Amended August 5, 1988)

**RULE 1109. EMISSIONS OF OXIDES OF NITROGEN FROM BOILERS
AND PROCESS HEATERS IN PETROLEUM REFINERIES**

(a) Definitions

- (1) BOILER means any combustion equipment fired with liquid and/or gaseous fuel and used to produce steam, including a carbon monoxide boiler.
- (2) PROCESS HEATER means any combustion equipment fired with liquid and/or gaseous fuel and which transfers heat from combustion gases to process streams.
- (3) REFINERY-WIDE RATE OF NITROGEN OXIDES EMISSIONS means the ratio of the total mass rate of discharge into the atmosphere of nitrogen oxides from units (subject to the rule) when firing at their maximum rated capacity to the sum of the maximum rated capacities for those units.
- (4) UNIT means any petroleum refinery boiler or process heater, as defined in subsections (1) and (2) of this section, with a permit to construct or a permit to operate prior to March 2, 1984.
- (5) NITROGEN OXIDES means the sum of nitric oxide and nitrogen dioxide in the flue gas, collectively expressed as nitrogen dioxide and averaged over a period of 15 consecutive minutes.
- (6) COMBUSTION MODIFICATION means any modification of the burner, combustion air flow, or fuel flow system that reduces nitrogen oxides emissions.
- (7) MAXIMUM RATED CAPACITY means maximum design heat input at the higher heating value of the fuel unless:
 - (A) the boiler/process heater is limited by permit condition to a lesser heat input, in which case the limiting condition shall be used as the maximum rated capacity; or
 - (B) the boiler/process heater is operated above the maximum design heat input, in which case the maximum operated rate shall be used at the maximum rated capacity.
- (8) EMISSIONS RATE means the ratio of the mass rate of discharge into the atmosphere of nitrogen oxides from a unit to the actual heat input for that unit.

- (9) HEAT INPUT means the heat of combustion released by fuel oxidation in a unit, using the higher heating value of the fuel. This does not include the enthalpy of incoming combustion air. In the case of carbon monoxide boilers, the heat input includes the enthalpy of all regenerator off gases and the heat of combustion of the incoming carbon monoxide and of the auxiliary fuel. The enthalpy of the fluid catalytic cracking unit regenerator off-gases refers to the total heat content of the gas at the temperature it enters the carbon monoxide boiler, referred to the heat content at 60°F, as being zero.

(b) Requirements

- (1) (A) From July 1, 1988 until December 31, 1992, the owner operator of any petroleum refinery shall reduce emissions of nitrogen oxides from units subject to this rule so that if all such units were operated at their maximum rated capacity the refinery-wide rate of nitrogen oxides emissions from these units would not exceed:
- (i) 0.14 pound (0.064 kilogram) of nitrogen oxides per million BTU of heat input when operated on gaseous fuel;
 - (ii) 0.308 pound (0.14 kilogram) of nitrogen oxides per million BTU of heat input when operated on liquid fuel;
 - (iii) the weighted average of the limits of subsections (b)(1)(A)(i) and (b)(1)(A)(ii), when operated concurrently on both liquid and gaseous fuel. For purpose of this rule, the nitrogen oxides formed in the fluid catalytic cracking unit regenerator shall be assumed to be from the burning of gaseous fuel.
- (B) On December 31, 1992 and subsequent dates, the owner or operator of any petroleum refinery shall reduce emissions of nitrogen oxides from each unit subject to this rule so that:
- (i) From December 31, 1992 until December 31, 1995, emissions from units which represent at least 36 percent of the total heat input are less than or equal to 0.03 pound per million BTU of heat input when firing at the maximum rated capacity, or as specified in the Alternative Emission Control Plan (AECPP). Any unit not meeting the 0.03 pound per million limit shall not exceed its pound per

million BTU limit specified in the Approved Control Plan for compliance with (b)(1)(A);

- (ii) From December 31, 1995, emissions are less than or equal to 0.03 pound per million BTU of heat input when firing at the maximum rated capacity, or as specified in the Alternative Emission Control Plan (AECP).
- (iii) For each unit firing at less than the maximum rated capacity, mass emissions of nitrogen oxides shall be less than or equal to the quantity that would occur at the applicable limit specified in (b)(1)(B)(i) and (b)(1)(B)(ii) at maximum rated capacity, or as specified in the AECP.
- (iv) Alternative Emission Control Plan (AECP)

An owner/operator may achieve compliance with paragraphs (b)(1)(B)(i) and (b)(1)(B)(ii) by achieving equivalent nitrogen oxides emissions reductions obtained by alternative control methods provided the applicant submits an Alternative Emission Control Plan that is enforceable by the District and receives approval of the Plan in writing from the Executive Officer prior to implementation. The Alternative Emission Control Plan shall:

- (I) Contain, as a minimum, all data, records, and other information necessary to determine eligibility for alternative emission control, including but not limited to:
 - a) A list of equipment subject to alternative emission control;
 - b) Daily hours of utilization for applicable equipment;
 - c) Estimated emission of nitrogen oxides for each operation;
 - d) Rated capacity; and
 - e) Historical and projected fuel use.
- (II) Present the methodology for estimation of equivalency of emission reductions under the proposed Alternative Emission Control Plan as

compared to either the emission reductions otherwise required by the rule or to actual emissions, whichever is less.

- (III) Demonstrate that the permit units subject to the specified rule emission limitations are in compliance with or on an approved schedule for compliance with all applicable District rules.
- (2) The owner or operator shall operate each unit subject to this rule such that the assigned maximum nitrogen oxides emissions rate for each unit (pounds or kilograms per million BTU heat input, expressed as nitrogen dioxide) is in accordance with the list approved by the Executive Officer pursuant to subsection (b)(6)(B), and any specified permit conditions.
 - (3) The owner or operator of any petroleum refinery which has units subject to this rule shall submit to the Executive Officer a control plan for installation of nitrogen oxides emissions control equipment to meet the requirements of subsection (b)(1);
Such plan shall contain as a minimum:
 - (A) A list of all units with the maximum rated capacity for each unit,
 - (B) A list of units to be controlled and the type of control to be applied for all such units, including a construction schedule,
 - (C) The method of calculation of the mass rate of nitrogen oxides emissions for each unit to achieve the refinery-wide emissions rates specified in subsection (b)(1), and
 - (D) On-site nitrogen oxide offsets from co-generation facilities may be incorporated in the plan.
 - (4) All units which are identified in the control plan required by subsection (b)(3) shall be tested, in a manner approved by the Executive Officer, for nitrogen oxides emissions while firing gaseous fuel and liquid fuel, if applicable, at the maximum rated capacity, or as near thereto as practicable. Such tests shall be performed:
 - (A) Within 180 days after completion of modifications, but no later than 1 month before any applicable compliance date for units which are to be modified with nitrogen oxides control equipment, and
 - (B) By December 1, 1986, for units which do not require modification.

- (5) Total nitrogen oxides emissions (pounds or kilograms per hour) and total heat input rates (million BTU's per hour) during the tests required by subsection (b)(4), while firing gaseous fuel and while firing liquid fuel, shall be used for determination of initial compliance with the refinery-wide rate of emissions limits of subsection (b)(1).
- (6) After verification of initial compliance with the limits of subsection (b)(1)(A):
 - (A) The owner or operator shall assign to each unit subject to this rule the maximum nitrogen oxides emissions rates (pounds or kilograms per million BTU heat input, expressed as nitrogen dioxide), while firing gaseous fuel or liquid fuel, which are allowable for that unit under the requirements of subsection (b)(1)(A).
 - (B) The owner or operator shall submit to the Executive Officer for approval a list, by the applicable compliance date, of the maximum allowable nitrogen oxides emissions rates identified in subsection (b)(6)(A) and a copy of the approved list shall be maintained for verification of continued compliance with the requirements of subsection (b)(2).
 - (C) Compliance with subsection (b)(1)(A) shall be determined by source testing any one unit subject to this rule, or additional units if required by the Executive Officer. No unit subject to this rule shall be operated at an emissions rate (pounds or kilograms per million BTU heat input, expressed as nitrogen dioxide) higher than that approved by the Executive Officer pursuant to subsection (b)(6)(B).
- (7) Each unit subject to this rule shall have a continuous in-stack nitrogen oxides monitor, or equivalent verification system, as approved by the Executive Officer at the time of compliance with the 0.03 pound per million BTU limit specified in subsections (b)(1)(B)(i) and (b)(1)(B)(ii).
 - (A) Records shall be maintained and made accessible for a period of two years to the Executive Officer in a form and manner as specified by the Executive Officer.
 - (B) Compliance with subsection (b)(1)(B) shall be determined by source testing and/or in-stack nitrogen oxides monitor data or other data as specified for the equivalent verification system.

(c) Revision of Control Plan

A revised control plan may be submitted by the owner operator, along with any required permit applications. Such a plan shall adhere to the emissions limits and the final compliance dates of this rule. New units, including functionally identical replacement units, shall not be incorporated into the plan.

(d) Exemptions

The requirements of Section (b) shall not apply to:

- (1) Boilers or process heaters with maximum rated capacities equal to or less than 40 million BTU per hour heat input.
- (2) Sulfur plant reaction boilers.
- (3) Upon approval by the Executive Officer, units which are operated with a total heat input in a 12 month period of less than 10 percent of the maximum rated capacity for that period.

(e) Compliance Schedule

The owner or operator of a petroleum refinery having units subject to this rule shall fulfill the following increments of progress:

- (1) For subsection (b)(1)(A), by July 1, 1988, demonstrate to the satisfaction of the Executive Officer final compliance with the rule.
- (2) For subsection (b)(1)(B)(i):
 - (A) By April 1, 1989, submit a revised control plan, pursuant to subsection (b)(3) of the rule.
 - (B) By September 1, 1989, submit required applications for permits to construct and operate.
 - (C) By December 31, 1992 demonstrate to the satisfaction of the Executive Officer compliance with (b)(1)(B)(i).
- (3) For subsection (b)(1)(B)(ii):
 - (A) By September 1, 1992, submit a revised control plan, pursuant to subsection (b)(3) of the rule.
 - (B) By February 1, 1993, submit required applications for permits to construct and operate.
 - (C) By December 31, 1995, demonstrate to the satisfaction of the Executive Officer compliance with (b)(1)(B)(ii).