REGULATION 62. 5
AIR POLLUTION CONTROL STANDARDS

STANDARD NO. 5.2 CONTROL OF OXIDES OF NITROGEN (NO_x)

SECTION I - APPLICABILITY

(a) Except as provided in paragraph (b) of this part, the provisions of this regulation shall apply to any stationary source that emits or has the potential to emit oxides of nitrogen (NOx) generated from fuel combustion that has not undergone a Best Available Control Technology (BACT) analysis for NOx in accordance with SC Regulation 61-62.5, Standard No. 7 and that meets one or more of the criteria specified in paragraphs (a)(1), (a)(2), and (a)(3) of this part:

(1) Any new source that is permitted to construct after the effective date of this regulation;

(2) Any existing source where a burner assembly is replaced with another burner assembly after the effective date of this regulation, regardless of size or age of the burner assembly to be replaced. The replacement of individual components such as burner heads, nozzles, or windboxes does not trigger the applicability of this regulation; or

(3) Any existing source that is removed from its presently permitted facility and moved to another permitted facility after the effective date of this regulation except process equipment and commercial or industrial boilers that are transferred between facilities within the state under common ownership. Such transfers will be considered as existing sources under (a)(2) above.

(b) Exemptions:

The following sources are exempt from all requirements of this regulation unless otherwise specified:

(1) Any source less than 10 x 106 BTU/HR rated input capacity that burns a fuel.

(2) Emergency power generators of less than 150 KW rated capacity, or those that operate 250 hours per year or less and have a method to record the actual hours of use such as an hour meter.

(3) Any internal combustion engine with a mechanical power output of less than 200 bHP.

(4) Any device functioning solely as a combustion control device.

(5) Any equipment that has NOx controls pursuant to the requirements 40 CFR Parts 60, 61, or 63 where such controls are equivalent to, or more stringent than, the requirements of this regulation.

(6) Any source that has NOx controls pursuant to the requirements of SC Regulation 61-62.96, where such controls are equivalent to, or more stringent than, the requirements of this regulation.

(7) Any source that has NOx controls pursuant to the requirements of SC Regulation 61-62.99.

(8) Flares

(9) Air Curtain Incinerators

(10) Fuel Cell Sources
(11) Engines test cells/stands

(12) Portable and temporary IC engines such as those associated with generators, air compressors, or other applications provided that they fall in the categories listed in 40 CFR 89, *Control of Emissions from New and In-Use Nonroad Compression-Ignition Engines*.

(13) Combustion sources that operate at a capacity of less than 10% per year.

(14) Special use burners, such as start-up/shut-down burners, that are operated less than 500 hours a year.

(15) Liquor guns on a recovery boiler are only exempt from the standard requirements in Section IV.

(16) Portable sources such as asphalt plants or concrete batch plants are only exempt from the standard requirements in Section III.

(17) The Department reserves the right to consider any other exemptions from this regulation on a case-by-case basis as appropriate.

SECTION II - DEFINITIONS

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

Burner Assembly: Means any complete, pre-engineered device that combines air (or oxygen) and fuel in a controlled manner and admits this mixture into a combustion chamber in such a way as to ensure safe and efficient combustion. A self-contained chamber such as is found on a combustion turbine is not a burner assembly for the purposes of this regulation.

Case-by-Case NOx Control: Means an emissions limitation based on the maximum degree of reduction for NOx which would be emitted from any new source which the Department, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source through application of production processes or available methods, systems, and techniques. In no event shall application of NOx control result

in emissions of any pollutant which would exceed the emissions allowed by any applicable standard. If the Department determines that technological or economic limitations on the application of measurement methodology to a particular source would make the impositions of an emission standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of NOx control. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means, which achieve equivalent results.

Combustion Control Device: Means, but is not limited to, any equipment that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere, excluding boilers, process heaters, dryers, furnaces, digesters, ovens, combustors, and similar combustion devices. Such equipment includes, but is not limited to, thermal oxidizers, catalytic oxidizers, and flares.

Constructed: Means the on-site fabrication, erection, or installation of the NOx emitting source.
Fuel: Means the following or any combination of the following: virgin fuel, fossil fuel, waste, waste fuel, biomass fuel, biofuel, methanol, ethanol, biodiesel, landfill gas, digester gas, process liquid or gas, or any combustible material the Department determines to be a fuel.

Source: Means an individual NOx emission unit.

Tune-up: Means adjustments made to the combustion process to optimize combustion efficiency of the source in accordance with procedures provided by the manufacturer or in accordance with good engineering practices.

SECTION III – STANDARD REQUIREMENTS FOR NEW SOURCES

(a) Those sources as defined in Section I (a)(1) and (a)(3) shall apply NOx controls capable of achieving the limitations provided in Table 1 of this section. Unless otherwise noted, all emission limits identified in Table 1 are based on monthly averages.

(b) A source may request an alternate control limitation by submitting a demonstration that the alternate limitation is a Case-by-Case NOx Control as defined in Section II.

(c) The Department reserves the right to request that the owner or operator submit additional information for those sources that request alternate control limitation in accordance with Section III (b) above.

(d) Sources required to install post combustion technology for the control of NOx, shall be required to use post combustion for the control of NOx during the ozone season (April 1 through October 31).

Table 1 - NOx Control Standards

Source Type	Control Technology and/or Emission Limit
Boilers and Water Heaters	
Natural Gas Fired Boilers	
≥10mmBTU/hr and < 100mmBTU/hr	Low NOx Burners or equivalent technology capable of achieving 30ppmv @ 3% O2 Dry (0.036 lb/mmBTU)
≥100mmBTU/hr	Low NOx Burners + Flue Gas Recirculation or equivalent technology capable of achieving 30 ppmv @ 3% O2 Dry (0.036 lb/mmBTU)
Distillate Oil Fired Boilers	
≥10mmBTU/hr and < 100mmBTU/hr	Low NOx Burners or equivalent technology capable of achieving 0.15 lb/mmBTU
≥100mmBTU/hr	Low NOx Burners + Flue Gas Recirculation or equivalent technology capable of achieving 0.14 lb/mmBTU
Residual Oil Fired Boilers	
≥10mmBTU/hr and < 100mmBTU/hr	Low NOx Burners or equivalent technology capable of achieving 0.3 lb/mmBTU
≥100mmBTU/hr	Low NOx Burners + Flue Gas Recirculation or equivalent technology capable of achieving 0.3 lb/mmBTU
Multiple Fuel Boilers	
The emission limits for boilers burning multiple fuels are calculated in accordance with the formulas below. Additional fuels shall be addressed on a case-by-case basis.	
≥10mmBTU/hr and < 100mmBTU/hr	$E_n = [(0.036 \text{ lb/mmBTU } H_{ng}) + (0.15 \text{ lb/mmBTU } H_{do}) + (0.3 \text{ lb/mmBTU } H_{ro}) + (0.35 \text{ lb/mmBTU } H_c) + (0.2 \text{ lb/mmBTU } H_w)]/(H_{ng} + H_{do} + H_{ro} + H_c + H_w)$ where: E_n is the nitrogen oxides emission limit (expressed as NO_2), ng/J (lb/million Btu) H_{ng} is the heat input from combustion of natural gas, H_{do} is the heat input from combustion of distillate oil H_{ro} is the heat input from combustion of residual oil, H_c is the heat input from combustion of coal, H_w is the heat input from combustion of wood residue.

Source Type	Control Technology and/or Emission Limit
≥100mmBTU/hr	E_n = [(0.036 lb/mmBTU H_{ng}) + (0.14 lb/mmBTU H_{do}) + (0.3 lb/mmBTU H_{ro}) + (0.25 lb/mmBTU H_c) + (0.2 lb/mmBTU H_w)]/(H_{ng} + H_{do}+ H_{ro} + H_c + H_w) where: E_n is the nitrogen oxides emission limit (expressed as NO_2), ng/J (lb/million Btu) H_{ng} is the heat input from combustion of natural gas, H_{do} is the heat input from combustion of distillate oil H_{ro} is the heat input from combustion of residual oil, H_c is the heat input from combustion of coal. H_w is the heat input from combustion of wood residue.
Wood Residue Boilers	
All types	Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.20 lb/mmBTU
Coal Fired Stoker Fed Boilers	
< 250 mmBTU/hr	Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.35 lb/mmBTU
≥ 250 mmBTU/hr	Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.25 lb/mmBTU
Pulverized Coal Fired Boilers	
< 250 mmBTU/hr	Low NOx Burners + Combustion controls to minimize NOx emissions or equivalent technology capable of achieving 0.35 lb/mmBTU
≥ 250 mmBTU/hr	Low NOx Burners + Combustion controls to minimize NOx emissions + SCR or equivalent technology capable of achieving 0.14 lb/mmBTU
Municipal refuse fired boilers	
< 250 mmBTU/hr	Combustion modifications to minimize NOx emissions + Flue Gas Recirculation or equivalent technology capable of achieving 200 ppmv @12% CO_2 (0.35 lb/mmBTU)
≥ 250 mmBTU/hr	Staged Combustion and Automatic Combustion Air Control + SCR or equivalent technology capable of achieving 0.18 lb/mmBTU
Internal Combustion Engines	

Source Type	Control Technology and/or Emission Limit
Compression Ignition	Timing Retard $\leq 4^{o}$ + Turbocharger w/ Intercooler or equivalent technology capable of achieving 490 ppmv @ 15% O_2 (7.64 gm/bhp-hr)
Spark Ignition	Lean Burn Technology or equivalent technology capable of Achieving 1.0 gm/bhp-hr
Landfill or Digester Gas Fired	Lean Burn Technology or equivalent technology capable of Achieving 1.25 gm/bhp-hr
Gas Turbines	
Simple Cycle – Natural Gas	
< 50 Megawatts	Combustion Modifications (e.g. dry low-NOx combustors) to minimize NOx emissions or equivalent technology capable of achieving 25 ppmv @ 15% O_2 Dry (0.054 lb/mmBTU)
$\geq$ 50 Megawatts	Combustion Modifications (e.g. dry low-NOx combustors) to minimize NOx emissions or equivalent technology capable of achieving 9.0 ppmv @ 15% O_2 Dry (0.033 lb/mmBTU)
Combined Cycle – Natural Gas	
< 50 Megawatts	Dry Low-NOx Combustors or equivalent technology capable of achieving 9.0 ppmv @ 15% O_2 Dry (0.033 lb/mmBTU)
$\geq$ 50 Megawatts	Dry Low-NOx Combustors + SCR or equivalent technology Capable of achieving 3.0 ppmv @ 15% O_2 Dry (0.011lb/mmBTU)
Simple Cycle – Distillate Oil Combustion	
< 50 Megawatts	Combustion Modifications and water injection to minimize NOx emissions or equivalent technology capable of achieving 42 ppmv @ 15% O_2 Dry Basis (0.16 lb/mmBTU)
$\geq$ 50 Megawatts	Combustion Modifications and water injection to minimize NOx emissions or equivalent technology capable of achieving 42 ppmv @ 15% O_2 Dry Basis (0.16 lb/mmBTU)
Combined Cycle - Distillate oil combustion	
< 50 Megawatts	Dry Low-NOx Combustors with water injection, or equivalent technology capable of achieving 42 ppmv @ 15% O_2 Dry Basis (0.16 lb/mmBTU)
$\geq$ 50 Megawatts	Dry Low-NOx Combustors, water injection, and SCR or Equivalent technology capable of achieving 10 ppmv @ 15% O_2 Dry Basis (0.038 lb/mmBTU)
Landfill Gas Fired	Water or steam injection or low NOx turbine design or equivalent technology capable of achieving 25 ppmv @ 15% O_2 (0.097 lb/mmBTU)

Source Type	Control Technology and/or Emission Limit
Cement Kilns	Low NOx burners or equivalent technology capable of achieving 30% reduction from uncontrolled levels.
Fluidized Bed Combustion (FBC) Boiler:	
Coal Fired	SNCR- Urea (Selective Noncatalytic Reduction - Urea) capable of achieving 51.8 ppm @ 3% oxygen (0.07 lbs/mmBTU)
Wood Fired	SNCR- Urea (Selective Noncatalytic Reduction - Urea) capable of achieving 51.8 ppm @ 3% oxygen (0.07 lbs/mmBTU)
Recovery Furnaces	4th level or air to recovery furnace/good combustion practices or equivalent technology capable of achieving 100 ppm @8% oxygen
Lime Kilns	Combustion controls or equivalent technology capable of achieving 175 ppm @ 10% oxygen
Fuel Combustion Sources Not Otherwise Specified: (Examples include but are not limited to process heaters not meeting the definition of "boiler" in Regulation 61-62.1 Section I, dryers, furnaces, ovens, duct burners, incinerators, and smelters)	Low NOx burners or equivalent technology capable of achieving 30% reduction from uncontrolled levels.

SECTION IV - STANDARD REQUIREMENTS FOR EXISTING SOURCES

(a) For those sources subject to the requirements of this regulation as defined in Section I (a)(2) above where an existing burner assembly is replaced after the effective date of this regulation, the burner assembly shall be replaced with a low NOx burner assembly or equivalent technology capable of achieving a 30 percent reduction from uncontrolled NOx emission levels based upon manufacturer's specifications. An exemption from this requirement shall be granted when a single burner assembly is being replaced in a source with multiple burners due to non-routine maintenance.

(b) For those sources defined in Section I (a)(2) above where an existing burner assembly is replaced after the effective date of this regulation, the owner or operator shall notify and register the replacement with the Department in accordance with Section V below.

(c) A facility may request an alternative control methodology to the one specified in paragraph (a) of this section provided that they can demonstrate to the Department why the NOx control limits specified are not economically or technically feasible for this specific circumstance. The Department reserves the right to request that the owner or operator submit additional information as necessary for the alternative control methodology determination. Alternative control methodologies granted under this part are not effective until notification is submitted to and approved by the Department.

SECTION V – NOTIFICATION REQUIREMENTS

(a) Except for those sources that wish to request an alternative control methodology as specified in Section IV(c), the notification requirements specified in this section shall apply only to existing sources as defined in Section I(a)(2) above where an existing burner assembly is replaced after the effective date of this regulation.

(b) Within 7 days of replacing an existing burner assembly, the owner or operator shall submit written notification to register the replacement unit with the Department.

(c) Notification shall satisfy the permitting requirements consistent with SC Regulation 61-62.1, Section II (a).

(d) Notification shall contain replacement unit information as requested in the format provided by the Department. Replacement unit information shall include, at a minimum, all affected units at the source and the date the replacement unit(s) will commence operation.

(e) Those sources that wish to receive an emission reduction credit for the control device will be required to submit a permit application.

SECTION VI – TUNE-UP REQUIREMENTS

(a) Owners or operators of a combustion source shall perform tune-ups every two years in accordance with manufacturer's specifications or with good engineering practices.

(b) All tune-up records are required to be maintained on site and available for inspection by the Department for a period of five years from the date generated.

(c) The facility shall develop and retain a tune-up plan on file.

THIS IS THE FEDERALLY APPROVED REGULATION AS OF **AUG 26, 2005.**

	Date Submitted to EPA	Date Approved by EPA	Federal Register
Original Reg:	DEC 29, 2004	AUG 26, 2005	70 FR 50195