1100 Air Quality Management Section

1112 Control of Nitrogen Oxides Emissions

11/24/1993

1.0 Applicability

Except, as provided in 4.0 of this regulation, the provisions of this regulation are applicable to major stationary sources of nitrogen oxides (NO_x).

11/24/1993

2.0 Definitions

As used in this subpart, all terms not defined herein shall have the meaning given them in the Clean Air Act and 7 **DE Admin. Code** 1101.

"**Building, structure, facility, or installation**" means all of the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous or adjacent properties, and are under the control of the same person (or persons under common control). Pollutant-emitting activities shall be considered as part of the same industrial grouping, if they belong to the same "Major Group" (i.e., which have the same first two digit code) as described in the Standard Industrial Classification Manual, 1987.

"**Capacity factor**" means the ratio of the average load on a machine or equipment for the period of time considered to the capacity rating of the machine or equipment.

"**Flue gas recirculation**" means recirculating a fraction of the flue gas to the burners to reduce peak flame temperature and oxygen availability with vitiated air for NO_x reduction.

"**Fuel burning equipment**" means each unit used for the burning of fuel or other combustible material for the primary purpose of utilizing the thermal energy released.

"**Gas turbine**" means an internal combustion engine that operates with rotary motion, is fueled by liquid or gaseous fuel, and may employ one of three types of combustors: annular, can-annular, or silo.

"**Internal combustion engine**" means a reciprocating engine which is fueled by liquid or gaseous fuel, produces heat or pressure developed in the engine cylinder or cylinders by burning a mixture of air and fuel, and is subsequently converted to mechanical work by means of a piston or pistons.

"**Lean burn technology**" means adjusting the air-to-fuel mixture ratio for reducing NO_x emission.

"**Liquid fuel**" means oil, kerosene, and other light petroleum product not technically termed oil.

"**Low excess air**" means operation with minimal combustion air to optimize thermal efficiency and reduce NO_x formation.

"**Low NOx burner technology**" means burner and windbox assemblies designed to minimize the formation of NO_x by various techniques, separated fuel jets, and controlled air mixing.

"**Major nitrogen oxides (NOx) emitting source**" means a stationary source which emits or has the potential to emit nitrogen oxides at a rate equal to or greater than 25 tons per year in

New Castle and Kent Counties and equal to or greater than 100 tons per year in Sussex County.

"**Potential to Emit**" means the maximum capacity of a stationary source to emit nitrogen oxides under its physical and operational design and maximum operating hours (8760 hours/ year) before add-on controls. Any physical or operational limitation on the capacity of the source to emit nitrogen oxides before add-on controls, such as restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design, if the limitation or effect it would have on emissions is state and federally enforceable.

"**Pre-ignition chamber combustion**" or "**cleanburn**" means NO_X control approach where cylinder heads are structured with small, separately fed, combustion chambers where a rich mixture is ignited by a spark plug, combusted, and then expanded into a very lean mixture in the main combustion chamber.

"**Reasonably Available Control Technology (RACT)**" means the lowest emission limit for NO_X that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.

"**Stationary source**" means any building, structure, facility, or installation which emits or may emit nitrogen oxides.

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3.0 Standards

3.1 Except as set forth in 5.0 and 6.0 of this regulation, after May 31, 1995, no owner or operator of a major NO_X emitting source subject to the provisions of this regulation shall cause to be discharged into the atmosphere any emission of nitrogen oxides without using reasonably available control technology.

3.2 Maximum allowable emission rates of nitrogen oxides from fuel burning equipment with a rated heat input capacity of 100 MMBTU/hour or greater shall be established as follows:

3.2.1 Existing fuel burning equipment shall be presumed to meet the definition of reasonably available control technology if the owner or operator demonstrates to the satisfaction of the Department that the emission levels in Table 3-1 of this regulation can be met.

TABLE 3-1
Pounds NO_X Per Million BTU Heat Input

		Firing Type	
Fuel Type	Face* and Tangential	Cyclone	Stokers
Gas Only	0.20	N/A	N/A
Oil or Gas or Both	0.25	0.43	N/A
Coal (Dry Bottom)	0.38	N/A	0.40

* Includes wall, opposed, and vertical firing methods.

3.2.2 If the owner or operator does not make the demonstration described in 3.2.1 of this regulation, RACT shall be installed with the goal of achieving the presumptive emission limits as set forth in Table 3-1 of this regulation. RACT for this category of equipment will consist of combustion modification technology including either:

3.2.2.1 low NO_x burner technology with low excess air and including Over Fire Air if technically feasible; or

3.2.2.2 flue gas recirculation with low excess air. If actual achievable emission levels following installation of such combustion modification technology are greater than the presumptive emission limits in Table 3-1 of this regulation, these actual emission levels will become RACT for those sources.

3.2.3 If the owner or operator does not comply with 3.2.1 or 3.2.2 of this regulation, alternative NO_x control technology and emission limitation proposals shall be required and approved by the Department in accordance with 5.0 of this regulation.

3.2.4 Compliance with the emission levels as determined above is based upon 24 hour rolling averaging period as follows:

3.2.4.1 For fuel burning equipment with a rated heat input of 250 MMBTU/hr or greater Continuous Emission Monitoring Systems (CEMS) approved by the Department will be used.

3.2.4.2 For fuel burning equipment with a rated heat input of 150 MMBTU/hr or greater but less than 250 MMBTU/hr compliance will be based on:

3.2.4.2.1 a CEMS approved by the Department; or

3.2.4.2.2 at the sources' request, an enhanced monitoring program approved by the Department. This enhanced monitoring program will identify and correlate various operating parameters with NO_x emission levels through source testing. These parameters will be used as surrogates to monitor NO_x emissions. Periodic source testing will be required to verify the validity of these surrogate parameters.

3.2.4.3 For fuel burning equipment with a rated heat input of 100 MMBTU/hr or greater but less that 150 MMBTU/hr compliance will be based on either 3.2.4.2.1 or 3.2.4.2.2 of this regulation or at the source's request by a periodic source testing program approved by the Department.

3.3 Maximum emission rates for nitrogen oxides from fuel burning equipment with a rated heat input capacity of less than 100 MMBTU/hr shall be as follows:

3.3.1 50 MMBTU/hr or greater: Shall not exceed those achieved by installation of either low excess air and low NO_x burner technology or flue gas recirculation technology, or equivalent NO_x control technology proposals approved by the Department in accordance with 5.0 of this regulation.

3.3.2 Less than 50 MMBTU/hr: Shall not exceed those achieved through an annual tune up performed by qualified personnel. The owner or operator shall maintain a log of the tune ups performed on each unit.

3.4 Maximum emission rate for nitrogen oxides from stationary internal combustion engines shall not exceed those achieved using pre-ignition chamber combustion or clean burn technology

for gas fired units and those achieved using lean burn technology for diesel fired units. Equivalent NO_X control technology proposals may be approved by the Department in accordance with 5.0 of this regulation.

3.5 Maximum allowable emission rates of nitrogen oxides from gas turbines are as follows:

TABLE 3-2
Parts Per Million Corrected to 15% O_2

Fuel Type	Simple of Combined Cycle
Gas	42
Liquid	88

NOTE 1: Compliance with the limits is based upon a one-hour averaging period using CEMS or an alternative method approved by the Department and EPA.

An equivalent NO_X control technology and emission limitation proposals may be approved by the Department in accordance with 5.0 of this regulation.

3.6 For sources who desire to switch to a lower NO_X emitting fuel, the practice of seasonal fuel switching shall be considered RACT and the requirements of 3.2.1 through 3.2.3 and 3.3 of this regulation shall not apply. Sources that would otherwise be subject to 3.2.1 though 3.2.3 of this regulation shall monitor their emissions in accordance with 3.2.4.1 through 3.2.4.3 of this regulation for compliance with the limits established in the Permit. Seasonal fuel switching is defined as the utilization (90% availability) of a single fuel during the summer ozone season (April 1 through October 31) that inherently produces considerably lower NO_X emissions than would be otherwise emitted. Fuel switching is limited to the use of natural gas, liquid petroleum gas (LPG), or distillate oil.

3.7 Except as set forth in 5.0 and 6.0 of this regulation for sources subject to the provisions of 3.2, 3.3, 3.4, 3.5 or 3.6 of this regulation, the owner or operator shall, by not later than November 15, 1993:

3.7.1 Notify the Department of their applicability status, and

3.7.2 Submit a schedule acceptable to the Department for achieving compliance with the standard as expeditiously as possible but not later than May 31, 1995, including interim dates for issuance of purchase orders, start and completion of modifications, and the completion of compliance testing.

3.8 Except as set forth in 5.0 and 6.0 of this regulation for major NO_X emitting sources not subject to the provisions of 3.2, 3.3, 3.4, 3.5, or 3.6 of this regulation, the owner and operator shall, by not later than November 15, 1993:

3.8.1 Notify the Department of their applicability status, and

3.8.2 Submit a determination as to what constitutes reasonably available control technology for the source including technical and economic support documentation, and

3.8.3 Provide a schedule, acceptable to the Department, for implementing the RACT program as expeditiously as possible, but not later than May 31, 1995, including interim dates for

the issuance of purchase orders, start and completion of modifications, and completion of compliance testing.

3.9 Any emission limits or other requirements necessary to define and enforce reasonably available control technology for applicable source types under this regulation, shall be made state and federal enforceable by a permit issued in accordance with 7 **DE Admin. Code** 1102.

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4.0 Exemptions

The following source types and sizes are exempt from the demonstration of reasonably available control technology requirement:

4.1 Any fuel burning equipment used exclusively for providing residential comfort heating and hot water;

4.2 Any incinerator or thermal/catalytic oxidizer constructed before November 15, 1992, and used primarily for the control of air pollution;

4.3 Any fuel burning equipment with a rated heat input capacity of less than 15 MMBTU/hour;

4.4 Any stationary internal combustion engine with a rated capacity of less than 450 hp of output power;

4.5 Any source operating during the month of November to the end of March and operating with a capacity factor of 5% or less from April 1 to October 31;

4.6 Any fuel burning equipment, gas turbine, or internal combustion engine with an annual capacity factor of less than 5%, except that three months following any calendar year during which the capacity factor is 5% or greater, the source shall be subject to the applicable provision of 3.0 of this regulation, except the compliance date shall be two years after approval of the schedule by the Department.

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5.0 Alternative and Equivalent RACT Determination

5.1 Reasonably available control technology determinations made pursuant to 3.8 of this regulation and alternate or equivalent measures determined under 3.2, 3.3, 3.4, or 3.5 of this regulation shall, by not later than November 15, 1993, be submitted to the Department for approval. The Department will approve, deny, or modify the RACT determination proposed.

5.2 Upon receipt of notice of the Department's approval of the RACT proposal, the source shall begin implementing the RACT program according to the schedule established in the approved RACT plan.

5.3 The Department will submit each RACT determination made under 5.0 of this regulation to the Environmental Protection Agency for approval as a revision to the State Implementation Plan (SIP). The expense of all public hearings associated with this action shall be borne by the applicant.

5.4 A person who owns or operates more than one installation subject to this regulation may use an alternative method of achieving an overall source NO_x emission reduction that is equivalent to the NO_x emission reduction that would be achieved if each individual unit at each installation complied with the RACT standards in 3.0 of this regulation.

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6.0 RACT Proposals

The RACT proposal submitted in accordance with 5.0 of this regulation shall include the following:

6.1 For sources that would otherwise be subject to 3.2 and 3.5 of this regulation:

6.1.1 Identification of the combustion modifications, fuel conversions, or other equipment or process modifications that are to be implemented;

6.1.2 Data and costs to support the RACT proposal;

6.1.3 A demonstration that shows why the RACT proposal is RACT for the particular installation, the expected emissions reduction, and any available emissions data for existing operating installations;

6.1.4 Baseline NO_x emissions for the installation established with Continuous Emission Monitoring (CEM) data or stack test data taken during steady state operation, or other methods approved by the Department.

6.2 For sources that would otherwise be subject to 3.3, 3.4, and 3.8 of this regulation:

6.2.1 Identification of the combustion modifications, fuel conversions, or other equipment or process additions, modifications, or adjustments to reduce NO_x emissions;

6.2.2 Technical and economical data that supports the proposed RACT proposal.

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7.0 Compliance Certification, Recordkeeping, and Reporting Requirements

7.1 The owner or operator of any major NO_x emitting source or sources shall submit to the Department an initial compliance certification not later than January 15, 1994.

7.1.1 The initial compliance certification shall, at a minimum, include the following information:

7.1.1.1 The name and the location of the facility;

7.1.1.2 The address and telephone number of the person responsible for the facility;

7.1.1.3 Identification of the subject source or sources.

7.1.2 For each subject source or sources, the initial compliance certification shall also provide, at a minimum:

7.1.2.1 The applicable standard;

7.1.2.2 The method of compliance;

7.1.2.3 Estimated emissions without controls;

7.1.2.4 The control system in use;

7.1.2.5 Estimated emission after control;

7.1.2.6 Certification that each subject source is in compliance with the applicable standard or has:

7.1.2.6.1 a RACT plan approved by the Department, or

7.1.2.6.2 a notice of timely RACT plan submittal which is deemed complete by the Department but is still in the approval process.

7.2 Each owner or operator of a source subject to this regulation shall maintain all records necessary for determining compliance with the standards at the facility for a period of five years.

7.3 Reporting requirements

The owner or operator of any source subject to 7.0 of this regulation shall, for each occurrence of excess emissions, within 30 calendar days of becoming aware of such occurrence, supply the Department with the following information:

7.3.1 The name and location of the facility;

7.3.2 The subject source or sources that caused the excess emissions;

7.3.3 The time and date of first observation of the excess emissions;

7.3.4 The cause and expected duration of the excess emissions;

7.3.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions;

7.3.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

7.4 Compliance Requirements

7.4.1 Where applicable, compliance with the approved RACT standard shall be based on CEM data collected in accordance with the requirements of 3.1.2 (Performance Specification 2) of 7 **DE Admin. Code** 1117, and in compliance with the requirements of 40 CFR, Part 60, Appendix F.

7.4.2 If the source is stack tested, EPA test method 7, 7E, or any other appropriate test method which has been approved in advance by the Department and EPA shall be used. The results of the tests shall be submitted to the Department within 45 days after completing the test.