



pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Air Quality

Final Rulemaking: Additional RACT Requirements for Major Sources of NO_x and VOCs

**Citizens Advisory Council
September 15, 2015**

Tom Wolf, Governor

John Quigley, Secretary

▶ RACT Overview

- Section 182 of the Federal Clean Air Act (CAA) requires States to adopt reasonably available control technology (RACT) requirements for existing major stationary sources of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in ozone nonattainment areas including the Ozone Transport Region (OTR), established under Section 184 of the CAA.
- The CAA requires a re-evaluation of RACT and submission of a State Implementation Plan (SIP) revision to EPA following the promulgation of new national ambient air quality standards (NAAQS) including the 8-hour ozone standards.
- RACT for affected major sources must be implemented statewide in Pennsylvania because the entire Commonwealth is included in the Ozone Transport Region. The OTR is treated as a “moderate” ozone Nonattainment area for NO_x and VOCs.

▶ RACT Overview

- EPA defines RACT as “the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility.”
- The term “reasonably available” rather than “best available” is intended to indicate greater flexibility for States to take into account the remaining economic life of the unit as well as factors that could increase the cost of installing a technology on an existing unit, when determining the appropriate control technology.
- RACT is not a “Transport Rule.”

RACT Overview

- The CAA requires States to submit (SIP) revisions for RACT to the U.S. Environmental Protection Agency (EPA) within two years after the effective date of designations for national ambient air quality standards.
- EPA's final designations for the 2008 8-hour ozone standard were effective on June 20, 2012. Therefore, the RACT SIP revision was due to EPA by June 20, 2014.
- Re-evaluation of RACT will also be necessary following EPA's adoption of revised ozone standards, expected by October 1, 2015.

Proposed RACT Rulemaking

- The proposed additional RACT requirements for the control of NO_x and VOC emissions from major sources (“RACT II”) were published in the *Pennsylvania Bulletin* by the Environmental Quality Board (EQB or Board) on April 19, 2014. (44 Pa.B. 2392)
- The public comment period closed on June 30, 2014.
- DEP received comments from 134 commentators.

Commentator Breakdown

- U.S. Environmental Protection Agency
- Independent Regulatory Review Commission
- Concerned Citizens/Environmental Groups
- Regulated Industries
 - Power Generation
 - Natural Gas Transmission
 - Portland Cement
- Other States
 - New Jersey
 - Maryland
 - Delaware
 - Connecticut

Key Comments

- Any source that has an emissions control device already installed should be required to operate the control device.
- The timing for compliance is too short.
- A company should not have to prove that averaging is not possible to apply for a case-by-case determination.
- Certain NO_x and VOC emission limits for turbines cannot be met without add-on controls, which may not be available for smaller turbines.

Main EPA Comments

- EPA recommended that DEP reevaluate RACT limits for boilers currently equipped with add-on controls.
- EPA advised the EQB to reevaluate the proposed presumptive RACT emission limits against current NO_x emission limits currently in effect in other states for municipal waste combustors.
- EPA recommended that the Board amend the averaging provisions to preclude averaging among sources inside and outside designated nonattainment area boundaries.

RACT Final Rulemaking

The final rulemaking establishes presumptive RACT requirements and emission limitations for approximately 810 major stationary sources of NO_x and VOC emissions including the following source categories:

- Combustion units
- Boilers
- Process heaters
- Turbines
- Engines
- Municipal solid waste landfills
- Municipal waste combustors
- Cement kilns
- Other sources that are not regulated elsewhere in 25 Pa. Code, Chapter 129.

Key Changes from Proposed to Final RACT Rulemaking

- The “Major NO_x emitting facility” and the “Major VOC emitting facility” definitions in § 121.1 were revised.
- The 25 tons per year (TPY) major source NO_x and VOC thresholds do not apply in Bucks, Chester, Delaware, Montgomery, and Philadelphia counties for major sources that will be subject to the RACT II requirements in 25 Pa. Code §§ 129.96—129.100. These counties are “marginal” nonattainment areas for the 2008 ozone standard
- The 25 TPY major source NO_x and VOC thresholds will continue to apply to sources subject to the existing RACT requirements in 25 Pa. Code §§ 129.91—129.95.

Key Changes from Proposed to Final RACT Rulemaking

- An exemption is provided for sources located at a major NO_x or VOC emitting facility that emit less than one TPY of NO_x or VOC emissions (§ 129.96(c)).
- Section 129.97(b)(1) requires tune-ups for combustion units to be consistent with EPA's tune-up requirements in 40 CFR 63.11223.
- Section 129.97(c) also requires compliance with manufacturing specifications and good operating practices for sources with potential NO_x emissions less than 5 TPY and potential VOC emissions less than 2.7 TPY.

Key Changes from Proposed to Final RACT Rulemaking

The final-form regulation includes revised presumptive RACT limits for the following categories:

- Municipal Waste Combustors;
- Natural gas-fired combustion unit or process heater with a rated input equal to or greater than 50 million Btu/hour;
- Coal-fired circulating fluidized bed combustion unit with a rated input equal to or greater than 250 million Btu/hour;
- The residual oil-fired combustion unit or process heater category now includes other liquid fuel-fired units; and
- Certain combustion units firing solid fuel (such as Biomass, Tire-derived fuel) other than coal .

Re-Evaluation of NO_x CEMS Data

- DEP conducted further review and analysis of the NO_x RACT emission limit for coal-fired electric generating units to assure approvability of the RACT II final-form regulation as a SIP revision.
- Based on the review of historical continuous emissions monitoring systems (CEMS) emissions data for coal-fired EGUs equipped with selective catalytic reduction (SCR) technology, DEP determined that the NO_x limit for these coal-fired units should be revised.

Re-Evaluation of NO_x CEMS Data

Average NO _x Rate, lb/MMBtu, presumably when SCR is in operation (i.e. <0.30 lb/MMBtu) over the <i>last 5 years</i>	Daily	30-Day
Homer City Unit 1	0.19	0.19
Homer City Unit 2	0.19	0.19
Homer City Unit 3	0.19	0.19
Bruce Mansfield (BM) Unit 1	0.12	0.12
Bruce Mansfield Unit 2	0.11	0.11
Bruce Mansfield Unit 3	0.14	0.14
Keystone (Key) Unit 1	0.10	0.10
Keystone Unit 2	0.10	0.09
Montour (Mon) Unit 1	0.15	0.15
Montour Unit 2	0.16	0.15
Cheswick	0.21	0.22
Average of BM, Key, Mon Only	0.12	0.12

Case-by-case RACT proposals may be submitted to DEP and the Allegheny County Health Department .

Key Changes from Proposed to Final RACT Rulemaking

Presumptive RACT Limits

- Any combustion unit with a selective catalytic reduction (SCR) system installed that is operating with an inlet temperature equal to or greater than 600°F, must meet a NO_x emission limit of 0.12 lb NO_x/million Btu. (§129.97(g)(1)(viii))
- Compliance with this emission limit is also applicable when by-passing the SCR system. (§ 129.97(g)(1)(viii))
- Any combustion unit with a SCR system installed that is operating with an inlet temperature less than 600°F, must meet a NO_x emission limit of 0.35 lb NO_x/million Btu heat input for a tangentially fired unit or 0.4 lb NO_x/million Btu heat input for other types of units. (§129.97(g)(1)(vi))

Key Changes from Proposed to Final RACT Rulemaking

Presumptive RACT Limits

- Any combustion unit with a selective non-catalytic reduction (SNCR) system installed must operate the SNCR system with the injection of reagents including ammonia or other NO_x-reducing agents, when the temperature at the area of the reagent injection is equal to or greater than 1600°F. (§ 129.97(g)(1)(ix))
- A circulating fluidized bed coal-fired combustion unit with a rated heat input equal to or greater than 250 million Btu/hour must meet a 0.16 lb NO_x /million Btu emission limit. This limit must be met at all times.

Key Changes from Proposed to Final RACT Rulemaking

Presumptive RACT Limits

- A combined cycle turbine with a rated output equal to or greater than 1,000 bhp and less than 180 MW
 - NO_x emission limit revised from 75 to 96 ppmv dry NO_x @ 15% oxygen for turbines fired on fuel oil.
 - VOC emission limit revised from 2 to 5 ppmv dry VOC (as propane) @ 15% oxygen for turbines fired on natural gas or other noncommercial gaseous fuel.
 - VOC emission limit revised from 2 to 9 ppmv dry VOC (as propane) @ 15% oxygen for turbines fired on fuel oil.
- A simple cycle turbine with a rated output equal to or greater than 6,000 bhp
 - NO_x emission limit revised from 75 to 96 ppmv dry NO_x @ 15% oxygen for turbines fired on fuel oil.

Key Changes from Proposed to Final RACT Rulemaking

Presumptive RACT Limits

- The following presumptive requirements have been added for a simple cycle or regenerative cycle combustion turbine with a rated output equal to or greater than 1,000 bhp and less than 6,000 bhp. (§ 129.97(g)(2)(iii))
 - NO_x emission limit of 150 ppmv dry NO_x @ 15% oxygen for turbines fired on natural gas, other noncommercial gaseous fuel, or fuel oil. (§ 129.97(g)(2)(iii)(A) and (B))
 - VOC emission limit of 9 ppmv dry VOC (as propane) @ 15% oxygen for turbines fired on natural gas, other noncommercial gaseous fuel, or fuel oil. (§ 129.97(g)(2)(iii)(C))

Key Changes from Proposed to Final RACT Rulemaking

Presumptive RACT Limits

- The natural gas-fired lean burn and rich burn engine categories now include “noncommercial gaseous fuels.” (§ 129.97(g)(3))
- Lean burn engines with a rated output equal to or greater than 500 bhp
 - VOC emission limit revised from 0.4 g/bhp-hr to 1.0 g/bhp-hr, excluding formaldehyde. (§ 129.97(g)(3)(i)(B))
- The applicable emission limit for a unit firing multiple fuels has been revised so that it is applicable to a unit that fires multiple fuels at any time, not just simultaneously. (§ 129.97(g)(4))

Key Changes from Proposed to Final RACT Rulemaking

- System-wide NO_x emission averaging has been restricted to sources located within the same ozone nonattainment area in this Commonwealth. (§ 129.98(a))
- The facility-wide or system-wide NO_x emission averaging equation has been revised in § 129.98(e).
 - The 0.9 factor is removed from the equation.
 - The equation now reflects a mass-to-mass comparison between actual and allowable NO_x emissions.
 - Aggregated actual emissions from sources included in averaging must be no greater than aggregated allowable emissions on a 30-day rolling basis.

Key Changes from Proposed to Final RACT Rulemaking

- Section 129.99(a) has been revised to specify that owners or operators of sources subject to presumptive RACT limitations or requirements are no longer required to show that the sources cannot participate in facility-wide or system-wide averaging before electing to apply for case-by-case RACT.
 - The owners or operators now must show that the sources cannot meet the applicable presumptive RACT limitations or requirements.
- Section 129.99(i)(2) now provides that the final compliance date for a proposal involving the installation of an air cleaning device must be no later than 3 years after the approval of the Plan Approval. If the petition pertains to the replacement of an existing source, the final compliance date will be determined on a case-by-case basis.

Key Changes from Proposed to Final RACT Rulemaking

Compliance Demonstrations

- Section 129.100(a) has been revised to clarify the compliance demonstration requirements for sources equipped with Continuous Emission Monitoring Systems including Portland cement kilns and municipal waste combustors. Subsection (a) also clarifies how a 30-day rolling average is calculated for a combustion unit.
- Section 129.100(e) requires an owner or operator of a source claiming an exemption to maintain records beginning with the compliance date for the regulation.
- Section 129.100(j) clarifies that **all** records must be retained for five years and made available to the DEP or an approved local air pollution agency, upon request.

Anticipated Impact on Allowable Emissions

Potential NO_x Emission Reductions Beyond Current RACT Allowable Emissions

Source Type	Potential NO _x Reduction (TPY)	Percent Reduction	Number of Units
Boilers	70,149	28%	257
EGUs with SCR	138,972	75%	12
Engines	20,596	44%	393
Turbines	23,906	40%	148
Total	253,623	47%	810

Potential to Emit = Allowable emission rate * maximum throughput per year.

Anticipated Impact on Allowable Emissions

Potential NO_x Emission Reductions from EGUs

	Current PTE	Proposed Rule PTE	Draft Final Rule PTE
Coal-fired EGUs	214,982	169,476	95,279
Waste Coal-fired EGUs	14,352	11,583	10,534

- Remaining EGUs - excludes retired facilities, facilities scheduled to be retired, and facilities switching to natural gas.
- Coal-fired EGUs operated in 2013 emitted 119,025 tons of NO_x.

Anticipated Impact on Actual NO_x Emissions

Expected NO_x Emissions from EGUs

Actual year 1990 NO _x emissions (tons) from coal-fired EGUs	428,219
Actual year 2000 NO _x emissions (tons) from coal-fired EGUs	192,004
Actual year 2013 NO _x emissions (tons) from coal-fired EGUs	119,025
Actual year 2013 NO _x emissions (tons) from coal-fired EGUs that are <u>not</u> scheduled for retirement or fuel-switching	92,728
Expected NO _x emissions (tons per year) from coal-fired EGUs based on the previous draft final-form RACT limitations and the 2013 production rates.	63,362
Expected NO _x emissions (tons per year) from coal-fired EGUs based on the current draft final-form RACT limitations and the 2013 production rates.	59,039

- Emissions data does not include data for waste coal and coal refuse-fired units.
- Actual emissions data obtained from EPA's Clean Air Markets Division (CAMD) database, except for 1990; the 1990 data was obtained from DEP's emission inventory.
- Under the Cross State Air Pollution Rule, the 2014 annual NO_x Budget for PA is 119,194 tons.

Key Changes from Proposed to Final Rulemaking

- The final rulemaking clarifies that the owners and operators of air contamination sources, except municipal waste combustors, equipped with continuous emission monitoring systems (CEMS) must demonstrate compliance with the RACT emission limitations on a 30-day rolling average basis.
- The owners of municipal waste combustors, equipped with CEMS, must demonstrate compliance based on Chapter 139 requirements using a daily average.
- The owners of Portland cement kilns equipped with CEMS must monitor production of clinker production rates in accordance with 40 CFR 63.135(d).

Key Changes from Proposed to Final Rulemaking

- EPA's final rule, "Implementation of the 2008 National Ambient Air Quality Standards for Ozone: State Implementation Plan Requirements," requires sources subject to RACT for the 2008 8-hour ozone standard to implement the requirements by January 1, 2017 (80 FR 12264, March 6, 2015).
- Therefore, the Board's final-form regulation now requires compliance with the RACT requirements and presumptive emission limitations by January 1, 2017 instead of one year from the effective date of the final rulemaking.

Advisory Committee Recommendations

- On November 7, 2014 , the Air Quality Technical Advisory Committee (AQTAC) approved the draft final-form RACT II regulation by a vote of 11-5-0 (yes; no; abstain) for consideration by the Board. DEP subsequently provided an update to AQTAC on April 16, 2015.
- On January 28, 2015, the Small Business Compliance Advisory Committee voted 6-2-0 to concur with the DEP recommendation to present the final rulemaking to the EQB for consideration.
- The Citizens Advisory Council's (CAC) Policy and Regulatory Oversight Committee considered the draft final RACT regulation on February 20, 2015 and May 12, 2015 and recommended moving the proposal to the full CAC.
- The CAC tabled discussion of the final rulemaking during its March 17th and May 20 meetings.

CAC Action Requested

- DEP is requesting that CAC concur with the department's recommendation to move the final rulemaking forward to the EQB for consideration on October 20, 2015.
- Following promulgation, the final rulemaking would be submitted to EPA for approval as a revision to the State Implementation Plan.



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