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Cc: [Gorman, Erin](#)
Subject: NOx RACT Cost-Effectiveness Calculation Guidance from EPA and Other OTR States
Date: Friday, October 30, 2015 8:30:52 PM

Hello Merrily and Wendy,

The purpose of this email is to provide supporting information for the Cost Effectiveness provisions of CTDEEP's NOx RACT regulation development and justify why using actual emissions is appropriate when making evaluations for existing equipment.

- Firstly, the EPA's guidance on NOx RACT, since the concept was first introduced, illustrates that cost effectiveness is directed at actual NOx emissions reduction. Within the 1994 EPA guidance for determination of cost effectiveness for a NOx RACT determination, language such as "For example, **sources that operate intermittently**, but whose peak operating times coincide with the peak ozone periods, **should be considered separately from sources with relatively constant year round emissions**", suggests that the cost-effectiveness calculation is considering actual emissions.
- Furthermore, the EPA's 1994 Alternative Control Techniques (ACT) Document -- NOx Emissions from Utility Boilers, which provides technical information for State and Local agencies to use in developing and implementing regulatory programs to control NOx emissions from fossil fuel fired utility boilers, has similar language that suggests that actual emissions should be used to calculate cost effectiveness. One such example is as follows:

*"The retrofit feasibility, NOx reduction potential, and costs of combustion controls are largely influenced by boiler design and operating characteristics such as firing configuration, furnace size, heat release rate, fuel type, **capacity factor**, and the condition of existing equipment"*

- In addition, calculated cost effectiveness values are reported in Chapter 6 for a wide variety of NOx control technologies applicable to utility boilers. Cost effectiveness is calculated for 30 different generic model boilers defined based on fuel type and boiler size and type. **Cost effectiveness in \$/ton NOx is calculated for three different capacity factors: 65% representing base load, 30% representing cycling duty and 10% representing a peaking unit.**
- CTDEEP's own analysis of NOx RACT for major combustion sources on a statewide basis ("CTDEEP RACT Analysis under the 2008 8-Hour Ozone NAAQS") relies exclusively on calculations based on actual (not potential) operation of the units. The report includes the following statements:

*"Otherwise, **only in cases where the technology review is significantly outdated and the source has sufficient actual emissions and useful life remaining, is it plausible that a reevaluation of RACT, the control measure with the least associated burden, will be warranted.***

*The traditional cost effectiveness (\$/ton of NOx emitted) evaluation of controlling NOx emissions from the load-following boilers and uncontrolled turbines will not address HEDD emissions because **the addition of controls on existing units that operate infrequently will nearly always result in a cost of control that is not reasonable**"*

This report included a citation for control technology evaluations which had

detailed cost information and an estimated schedule for installation and operation of controls which was provided in attachment 1. The cost analyses for existing sources that are included in the Attachment 1 spreadsheet all include information on the **capacity factors of the units that are taken into account in the analysis**.

- Other states in the region also rely on actual emissions in their RACT proposal requirements such as Pennsylvania and New Jersey.
 - Pennsylvania § 129.92. RACT proposal requirements:
 - § 129.92. (a)(4) Each RACT proposal shall, at a minimum, include estimates of the **potential and actual NO_x and VOC emissions** from each affected source and associated supporting documentation.
 - § 129.92. (b)(3)(i) The RACT analysis required under subsection (a)(5) shall include a ranking of the technically feasible control options in order of overall control effectiveness for NO_x or VOC emissions. The list shall present the array of control options and shall include, at a minimum, the following information **the baseline emissions of VOCs and NO_x** before implementation of each control option.
 - § 129.92. (b)(4) The RACT analysis required under subsection (a)(5) shall include an evaluation of cost effectiveness of each control option consistent with the “OAQPS Control Cost Manual” (Fourth Edition), EPA 450/3-90-006 January 1990 and subsequent revisions. The evaluation shall be conducted in accordance with:
 - (ii) The cost effectiveness shall be calculated on average and incremental bases for each option. Average cost effectiveness is calculated as the annualized cost of the control option divided by the **baseline emissions rate minus** the control option emission rate.
 - (iii) For purposes of this paragraph, **baseline emission rate represents the maximum emissions before the implementation of the control option. The baseline emissions rate shall be established using either test results or approved emission factors and historic operating data.**
 - NJDEP’s NO_x RACT regulations include provisions for case-by-case analysis at 7:27-19.13: Alternative and facility-specific NO_x emission limits. The approval requirements for case-by-case NO_x RACT proposals include determinations of actual cost-effectiveness:

The Department shall approve the proposed plan or request only if it satisfies the following requirements:

[...]

3. For any control technologies described in (g)2 above which the owner or operator does not propose to use on the equipment or source operation, the proposed plan or request demonstrates that the control technology:

[...]

iii. Would carry costs disproportionate to the improvement in the reduction of the NO_x emissions limit which the control technology is likely to achieve,

or disproportionately large in comparison to the **total reduction in NOx emissions which the control technology is likely to achieve over its useful life...**

For all of these reasons, we believe using actual emissions in a case-by-case RACT analysis is appropriate.

Thank you for your consideration.

Best regards,

-Bob

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