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June 30, 2014

Environmental Quality Board (EQB)
Rachel Carson State Office Building, 16th Floor
400 Market Street
Harrisburg, PA 17101-2301

**Re: Pennsylvania Department of Environmental Protection Proposed Rule,
Additional RACT Requirements for Major Sources of NOx and VOCs,
PA Bulletin, Vol. 44, No. 16 (April 19, 2014)**

Dear Sir or Madam:

The Williams Companies, Inc. (Williams) respectfully submits these comments regarding the Pennsylvania Department of Environmental Protection (PA DEP) Proposed Rule, *Additional RACT Requirements for Major Sources of NOx and VOCs*, 25 PA Code, Chapters 121 and 129; Pennsylvania Bulletin, Vol. 44, No. 16 (April 19, 2014).

Williams is one of the leading energy infrastructure companies in North America. It owns an interest in or operates more than 15,000 miles of interstate natural gas pipelines, transporting 14% of the nation's natural gas. Williams has a significant Midstream presence in Pennsylvania, operating more than 2,200 miles of midstream pipe. Williams' midstream assets in Pennsylvania include Laurel Mountain Midstream LLC, Three Rivers Midstream LLC, Williams Field Services, Laser Northeast Gathering Company LLC and Williams Gathering & Processing.

Williams also operates Transcontinental Gas Pipe Line Company, LLC (Transco), a 10,200-mile natural gas transportation system that extends from South Texas to New York City. Transco has reliably served Pennsylvania for more than 60 years, providing service to major local distribution companies. Transco currently operates six compressor stations and more than 1,000 miles of transmission pipeline in Pennsylvania, delivering approximately 30% of the total gas Pennsylvania consumed in 2013.

Proposed Rule Impacts

Based upon an initial assessment, six existing Transco natural gas compressor stations are major NOx and/or VOC sources that would be subject to the proposed regulations. These facilities operate both natural gas-fired reciprocating internal combustion engines (RICE) and natural gas-fired turbines to drive compressors. Approximately 40 existing engines and turbines located at Transco facilities would be subject to the presumptive NOx and/or VOC emission limits included in this proposed regulation.

Overview of Comments/Recommendations

Williams recommends revisions to the Proposed Rule to address key issues including PA DEP's underestimate of the number of affected units and associated costs, feasibility of proposed volatile organic compound (VOC) emission limits, and a compliance schedule that avoids unintended negative consequences. In addition, the comments address applicability thresholds and compliance options. These recommendations strive to achieve the PA DEP objective of reducing the paperwork burden associated with alternative, case-by-case RACT requests.

Williams also supports and endorses comments submitted by the Interstate Natural Gas Association of America (INGAA), a trade association of the interstate natural gas pipeline industry. INGAA members operate numerous natural gas transmission compressor stations in Pennsylvania that would also be affected by the Proposed Rule.

Based upon the enclosed comments, Williams believes the current regulatory analysis does not provide adequate support for adoption of the proposed NOx and VOC RACT regulations as they are currently formulated. Thus, Williams recommends that the Environmental Quality Board return the Proposed Rule to the Department to allow development of a regulatory analysis that clearly demonstrates that any presumptive RACT limits established for existing natural gas-fired engines and turbines are achievable based upon currently available, cost effective retrofit technology.

Attached to this letter is a one-page summary of Williams' comments for distribution to each Environmental Quality Board member, a detailed statement of comments, as well as supporting materials.

Williams appreciates the opportunity to provide the attached comments for consideration by the Environmental Quality Board. Should you have questions regarding these comments, please contact Mary Beth Whitfield (mary.beth.whitfield@williams.com) at (713) 215-4562 or myself (michael.c.callegari@williams.com) at (713) 215-4584.

Sincerely,



for Michael C. Callegari
Manager, Environmental Services – Atlantic Gulf
Operational Excellence
The Williams Companies, Inc.

cc by email: Kirit Dalal, Chief, Division of Air Resource Management, PA DEP
Krishnan Ramamurthy, Chief, Division of Permits, PA DEP

Detailed Comments

1. The Proposed Rule significantly under-estimates the number of affected units that would require installation of NOx or VOC control technology.

Williams completed an initial review to assess the number of affected units at natural gas transmission and storage facilities that would *require installation of emission controls*. At its Transco facilities, Williams operates approximately 40 natural gas-fired engines and/or turbines that could be affected by additional emission control requirements. Note this count does not include affected units that currently meet the proposed emissions standards or units that are required to meet good combustion practices; there would still be permitting and compliance obligations for those units.

For INGAA members, a preliminary assessment of information from five companies indicates over 40 facilities with over 150 affected units, including approximately 25 turbines and 130 RICE, would require installation of emission controls. These figures compare with PA DEP projections from the Regulatory Analysis Form (RAF) of approximately 141 affected units at 192 facilities for all affected facilities. Since many other types of equipment and industries are affected by the Proposed Rule, it is clear that PA DEP's analysis significantly under-estimates the number of affected units and the corresponding cost impact of the Proposed Rule.

The number of affected units in natural gas transmission has significant implications for Williams, for INGAA members, and for rule implementation. The recommendations discussed in comments below strive to remedy important issues. For example, as discussed in Comment 2, company planning and coordination to install emissions controls on dozens of units at multiple facilities has scheduling and gas transmission reliability implications. As discussed in Comment 3, if VOC issues are remedied, the number of affected units would significantly decrease because many affected units can already achieve the proposed NOx limits and would only require VOC control.

2. The Proposed Rule compliance schedule is not feasible and could affect the reliability of natural gas delivery. Operators should be allowed to provide a plan, for PA DEP review and approval, that establishes the compliance schedule for each operator's affected equipment.

The Proposed Rule compliance schedule is not feasible. The schedule requires compliance within one year, with the ability to request an extension that allows up to three years to comply. For Transco, with 40 potentially affected units, scheduling could impact the reliability of gas delivery, and more than three years would be necessary to achieve compliance. To avoid unnecessary paperwork associated with requesting extensions, PA DEP should revise the Proposed Rule to accommodate a logical, planned schedule for implementing controls.

A. Scheduling limitations and requirements

As proposed, Williams would be required to address control requirements for multiple units across multiple facilities. Many factors impact project schedule, including technology availability (i.e., vendor supply limitations), integrating downtime into schedules to avoid service interruption, consideration of budget cycles and integration with other pipeline projects, state and federal

permitting, and the time necessary to commission and debug the control technology. Natural gas compressors must be available during the winter heating seasons, as well as spring and fall injection/withdrawal seasons. This limits the amount of time a unit can be taken out of service for installation of retrofit controls because natural gas delivery cannot be constrained due to equipment outages. In addition, site operating requirements often limit out-of-service equipment to one unit per site at any given time.

For the natural gas transmission industry as a whole, most of the affected units are lean burn RICE that would require retrofit of LEC technology to reduce NO_x emissions. These large bore, slow speed engine (power side) and compressor (driven equipment) share a common crankshaft, thus these are referred to as “integral” units. Integral engines are unique to gas compression service, and were designed specifically for natural gas pipeline applications. Due to the unique nature of the equipment, the pipeline industry conducted a multi-million dollar research and development program over more than a decade to develop LEC technology for slow speed integral units. R&D and technology commercialization was developed with support from service providers experienced with this equipment, and there are a limited number of LEC retrofit service providers for integral engines. As an example of supply limitations, turbocharger installation or upgrade service, which is needed to address combustion air requirements for LEC, is available from only two suppliers for slow speed integral engines.

If a compliance schedule of three years or less is required, operators would have no other alternative than to remove natural gas transmission and storage compressor drivers from service during the demand season. At this time, the implication of this potential loss of system horsepower has not been assessed, but the reliability of natural gas deliveries could be impacted. This scenario would impact prices and infringe upon other regulatory requirements governing pipeline operations that are administered by the Federal Energy Regulatory Commission.

Williams’ previous experience with NO_x RACT implementation in Pennsylvania and other states, where fewer affected units were involved, demonstrates a need for a longer compliance period to complete installation and certify compliance. For example, Transco Station 200, located in Chester County, was required to implement PA DEP NO_x RACT requirements during the mid-1990s. As shown in the attached timeline (**Attachment 1**), Transco Station 200 required over three years to fully implement LEC retrofits on thirteen lean-burn RICE. This timeframe did not include added complexities of planning, managing, and coordinating projects at multiple facilities and compete with other companies for limited resources from service providers. In addition, the project did not require Prevention of Significant Deterioration (PSD) or nonattainment New Source Review (NSR) permits, which would introduce significant additional time to the process.

Operators’ efforts to comply with the Proposed Rule may coincide with other pipeline projects (e.g., expansion to address growing markets associated with development of the Marcellus Shale resource), so PSD permitting will likely be required in some cases. Compounding facility- or company-specific schedule challenges is the fact that the Proposed Rule would potentially affect over 100 natural gas transmission RICE and turbines across the industry. All of these units would need to be taken off-line to install and commission emission controls, and this is simply not practical within three years. A serious impact could result from simultaneous shutdown of multiple engines

and turbines at one facility, along a single pipeline route, or along multiple pipelines serving a similar market, and widespread natural gas delivery problems could occur with a compliance schedule of three years or less.

Finally, the Proposed Rule requires that operators request a schedule extension within 6 months. A longer time frame is needed to provide a detailed plan that accommodates significant project planning and budgeting to implement controls for the many affected units across multiple facilities.

B. Recommended alternative for defining compliance schedules

PA DEP should revise the rule to accommodate an approach where a reasonable schedule is defined for each company. The regulation should allow operators to develop a plan – subject to Department review and approval – to establish a reasonable compliance schedule for affected equipment at a facility that considers company, facility, and unit-specific challenges.

Williams recommends these specific changes to the proposed rule:

- Within 6 months, the company submits a notification that identifies the affected equipment and facilities, and the applicable emission limits.
- Within 18 months, the company submits a detailed plan for all affected equipment and facilities. This plan would include details regarding all of the affected units, controls to be implemented, and implementation schedule. The plans would be developed with an understanding that PA DEP desires commissioning of emission controls as soon as practical.
- Within 3 months of plan submittal, PA DEP approves the plan or responds with questions or comments.

This approach avoids the unnecessary paperwork associated with an initial extension request, acknowledges that company specific challenges may vary (e.g., number of affected units, integration with other pipeline projects), and provides a path to compliance that includes reasonable schedules that will not compromise the reliability of natural gas delivery.

3. The Proposed Rule VOC emission limits should be deleted or replaced with compliance based on good engineering practices.

The Proposed Rule support documentation does not adequately address the proposed VOC limits. The preamble and RAF focus on NOx reductions and devote minimal discussion to the implications of VOC controls. Not only does PA DEP provide limited information to support VOC limits, but the minimal information provided is inaccurate. For Williams, all non-emergency lean burn RICE at its compressor stations would be affected by the Proposed Rule, and those units would require oxidation catalyst installation to meet the proposed VOC limit of 0.4 grams per brake horsepower-hour (g/bhp-hr).

Gas transmission companies, including Williams, would incur significant costs to comply with VOC limits while achieving minimal VOC reductions. VOC controls are not cost effective. Williams recommends deleting VOC limits from the rule.

If PA DEP does not delete these limits, then the agency should document the basis for the standards and assess the corresponding cost implications. For example, it is unlikely that oxidation catalysts are economically feasible. At most, VOC requirements should be addressed by following good engineering practices consistent with the requirements in §129.97(c), as explained further in this comment.

A. Basis for RICE and turbine emission standards

For rich burn RICE, affected units would comply using non-selective catalytic reduction (NSCR). The proposed VOC standard of 1.0 g/bhp-hr is consistent with NSCR technology performance. Further, this VOC emission standard is consistent with the emission limit for reconstructed or modified RICE in the Federal New Source Performance Standard (NSPS)¹, Subpart JJJJ.

In the RAF, PA DEP does not explain the basis of the VOC emission standards for natural gas-fired turbines. Based upon the industry's limited emission data available, VOC emissions from gas turbines are already very low. Further, VOC emission standards are not common. PA DEP should document the basis for the concentration-based turbine standard in its RAF.

For lean burn RICE, the VOC standard is not consistent with Subpart JJJJ and would require an oxidation catalyst retrofit. As discussed below, this is not a cost effective control strategy. As a result, PA DEP can expect dozens, or perhaps hundreds, of requests for a case-by-case RACT determination from natural gas transmission companies. Those requests will demonstrate that the proposed VOC emission limit is economically infeasible for retrofit applications. Williams recommends alternatives below. If these alternatives are not accepted, PA DEP should provide background documentation to support the VOC standard, and prepare for the burden of case-by-case analysis.

B. Proposed alternatives for VOC emissions and case-by-case RACT implications

If PA DEP believes that VOC emissions must be addressed in the rule, then an alternative approach is recommended. Across the natural gas transmission industry, over 100 lean burn RICE may require installation of VOC controls. This impact was not considered in the Proposed Rule support documentation, which presumes no additional control would be required. In addition, PA DEP's analysis does not indicate whether meaningful an environmental benefit would be derived from VOC reductions. Williams believes that that additional VOC controls should *not* be required, and recommends the VOC emission limits be eliminated from the rule to achieve that objective.

Most Transco engines currently meet the NO_x requirements of the Proposed Rule. However, these engines cannot currently meet the VOC limits – and would thus be affected units under the Proposed Rule. The proposed VOC limits will likely result in submittal of alternative case-by-case RACT requests for all affected Transco engines.

¹ Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. 40 CFR, Part 60, Subpart JJJJ.

Standard based on good engineering practices

If VOCs emission standards are retained in the rule, PA DEP should base the requirement on good engineering practices, consistent with the requirements for smaller units defined in §129.97(c). In this scenario, §129.97(c)(2) for turbines and §129.97(c)(3) for RICE would be revised to address units of all sizes rather than include the thresholds in the Proposed Rule. In addition, since *manufacturer* specifications may not be available for some existing units or units may have been upgraded (e.g., LEC control) with third party technology, the text in §129.97(c) should be revised as follows:

“...shall comply with the following presumptive RACT requirement, which is the installation, maintenance and operation of the source in accordance with operator-defined or manufacturer’s specifications and good engineering practices: ...”

Alternative VOC standards

If PA DEP retains VOC emission standards, additional support documentation is needed to justify the limits. For Subpart JJJJ, formaldehyde is excluded when calculating VOC emissions (see subsection D). The Proposed Rule rich burn engine standard is consistent with Subpart JJJJ if formaldehyde is excluded and is achievable with NSCR technology. The proposed VOC standards for natural gas-fired lean burn engines and turbines are not supported.

For lean burn engines, the Subpart JJJJ rulemaking record includes technical documentation that justifies an emission standard of 1.0 g/bhp-hr, with formaldehyde excluded when calculating VOC emissions. This standard is based on LEC technology that provides NO_x reductions and acceptable VOC emissions. Additional add-on control (i.e., oxidation catalyst control) is not warranted because it is not cost effective (see subsection C). Williams recommends a VOC emission limit for lean burn engines of 1.0 g/bhp-hr, with formaldehyde excluded from the calculation. A 1.0 g/bhp-hr emissions limit that excludes formaldehyde is not re-defining VOCs, but rather establishing a standard indicative of emissions performance as measured by common test methods (see subsection D).

C. VOC control cost effectiveness

For lean burn RICE, oxidation catalyst control for CO, VOCs, or HAPs has previously been reviewed during development of the Federal NSPS (i.e., Subpart JJJJ) and NESHAP (Subpart ZZZZ).² Technical challenges include a lower characteristic exhaust temperature for lean burn engines with LEC control. Exhaust temperatures are lower for 2-stroke lean burn (2SLB) engines than 4-stroke lean burn (4SLB) engines. Note that 2SLB integral engines are common in natural gas transmission. Thus, there are technical feasibility issues that need to be considered, and addressing those challenges can increase costs (e.g., larger catalyst with higher noble metal loading). There is no reasonable basis to conclude that a VOC limit of 0.4 g/bhp-hr is achievable either with or without catalyst controls. Even if technical feasibility can be demonstrated, a cost effectiveness analysis would conclude that catalytic control is not economically feasible.

² National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. 40 CFR, Part 63, Subpart ZZZZ.

Costs for retrofit installation of catalysts can result in significantly higher costs than for a new unit, where the catalyst can be incorporated into the design of new equipment. Example costs include addressing space limitations that may include significant re-plumbing of exhaust ducts, foundation requirements to accommodate additional weight for the reconfigured exhaust, exhaust silencer (i.e., “muffler”) replacement, and other exhaust re-design required to manage back-pressure and avoid operational problems (e.g., back-pressure is an important consideration for 2SLB engines).

If technical challenges can be addressed, the resulting VOC reductions will be limited. For example, as indicated by Subpart JJJJ emission limits, retrofit lean burn engines can typically meet NO_x limits of 3.0 g/bhp-hr and VOC limits of 1.0 g/bhp-hr without an oxidation catalyst. With actual emissions less than 1.0 g/bhp-hr, only nominal reductions would be achieved by reducing VOC emissions to the Proposed Rule limit of 0.4 g/bhp-hr.

The RAF indicates a VOC cost effectiveness benchmark of \$5,000 per ton. Examples discussed in the RAF focus on NO_x reductions, and the Proposed Rule assumes that additional VOC controls would not be required. This is not the case, and costs will be incurred. A detailed analysis is not provided here, but an example VOC cost effectiveness analysis was completed using standard procedures from EPA’s Control Cost Manual and assumptions from previous analysis. An example based on a 2,100 hp lean burn engine, actual emissions of 0.75 g/bhp-hr that are reduced to 0.4 g/bhp-hr, and 40% utilization (which is an approximate “average” value for gas transmission equipment) resulted in a VOC reduction cost effectiveness of \$33,000 per ton and VOC reductions less than 3 tons per year. If full utilization is considered (i.e., 8,000 operating hours per year), the costs effectiveness is \$14,400 per ton with 6.5 tons of VOC reductions. These examples exceed the \$5,000 per ton VOC cost benchmark from the RAF. Additional details and an analysis that includes incremental costs associated with exhaust design challenges discussed above can be provided if desired.

PA DEP should consider an alternative to the proposed VOC emission limits. The VOC limits should either be replaced with work practices that require good engineering practices or revised for consistency with NSPS limits. This revision is necessary to avoid the burden of numerous alternative RACT requests while pursuing minimal VOC reductions.

D. Test methods and formaldehyde emissions

Methods for measuring VOC emissions from natural gas-fired combustion equipment are typically based on measuring hydrocarbons and excluding methane and ethane from the total. For example, EPA Method 25A measures total hydrocarbons (THC), with methane and ethane measured using EPA Method 18 and subtracted from the THC value. Formaldehyde is a VOC and a component of RICE exhaust, but specialized methods are required to measure formaldehyde accurately. As a result, most VOC emissions data from engine manufacturers and in the literature are based on test results that exclude formaldehyde. For this reason, EPA excluded formaldehyde from the VOC limits in Subpart JJJJ, as noted in 40 CFR, §60.6241(h), where EPA specifically stated,

“For purposes of this subpart, when calculating emissions of volatile organic compounds, emissions of formaldehyde should not be included.”

Unless it is clearly indicated otherwise (e.g., based on test methods used), it should be assumed that VOC data reported for gas-fired RICE excludes formaldehyde. Due to historical data and test method challenges, it is appropriate to exclude formaldehyde from the compliance determination for VOC emissions. This approach does not re-define VOC to exclude formaldehyde. Rather, it defines a compliance method indicative of the data used to establish the standard, and avoids the need for complex, costly formaldehyde testing.

For the purposes of demonstrating compliance with VOC emission limits, the Proposed Rule should be revised for consistency with Subpart JJJ, and a section similar to Subpart JJJ, §60.4241(h) should be added to the PA DEP rule.

E. If emissions standards are retained, VOC averaging should be allowed

The Proposed Rule includes compliance flexibility using emissions averaging. Williams supports emissions averaging and offers several recommendations in Comment 5. If VOC emissions limits are retained in the rule, the flexibility provided for NO_x emissions should also be offered for VOC emissions, and VOC emissions averaging should be added to the rule.

4. Williams supports including emissions averaging, but the Proposed Rule should be revised so that operators can elect to use emissions averaging without first demonstrating that unit-specific emission limits cannot be met.

Williams supports including emissions average in the Proposed Rule. However, as explained in the preamble, the Proposed Rule includes a compliance hierarchy where emissions averaging is an option if the subject source cannot meet the emission limits. Williams supports including emissions averaging as a compliance option that is used at the discretion of the operator rather than requiring operators to first demonstrate that emission limits cannot be met.

Emissions averaging is included in other PA DEP, EPA, and state rules, as discussed below. Since operators will build conservatism into averaging plans to ensure that emissions obligations are achieved, emissions averaging will provide equivalent or greater reductions than complying with prescribed emission limits.

PA DEP should revise the Proposed Rule to allow operators to elect to comply with the emissions limits or by using emissions averaging.

A. PA DEP and other rules use emissions averaging

Transco currently complies with existing PA DEP rules through the use of emissions averaging. Although the current RACT rule prefers use of Continuous Emissions Monitoring Systems (CEMS), §129.94(b)(5) allows alternative options based on periodic testing, and averaging has been approved and successfully implemented. Similarly, §145.111-113 addresses requirements for engines regulated in response to the NO_x SIP Call Phase 2 Rule, and §145.113(c)(2)(ii)-(iii) allow periodic testing and/or parameter monitoring as the basis for determining actual emissions. These same

principles should apply for the new RACT proposal, and operators should be allowed to implement averaging on a facility level or company level basis.

The EPA and other states also allow emissions averaging. Following the release of the NO_x SIP Call Phase 2 Rule, EPA developed and released a model rule as state guidance. The EPA model rule includes averaging provisions that were adopted in part by many U.S. states subject to this SIP Call. For example, Illinois used the EPA model rule when developing and adopting its regulations that addressed RACT requirements and fulfilled obligations of the SIP Call. The rule includes emissions averaging and requires operators to submit an averaging plan that defines the compliance approach and monitoring used to assure compliance. Similarly, West Virginia regulations allow averaging on a facility level or company level basis and use periodic emission tests.

These examples show that emissions averaging is an effective compliance tool in Pennsylvania and other states. Similar access to emissions averaging should be included in this RACT rulemaking.

B. Emissions averaging should not include a 10% penalty and averaging computations should include engineering units consistent with the applicable emission standard.

The Proposed Rule includes an equation for calculating the NO_x RACT emissions limitation for averaging in §129.98(e). The equation requires ten percent “over-control” and presents emission rates in pounds per million British thermal unit (lbs/MMBtu). These criteria are not consistent with emissions averaging currently used for the PA DEP rules discussed in the previous subsection, and should be revised for consistency with current rules.

A 10% penalty is not included in the current RACT rule, which applies in nonattainment counties, or in the §145.111-113 NO_x rules for large engines. A penalty or mandatory over-control should not be included in this rule, and is not necessary because conservatism will be built into company compliance plans.

For natural gas transmission operations, compressor utilization can vary over time depending on customer demand and evolving markets. Since averaging includes a reconciliation of emissions based on actual operations (e.g., actual fuel usage), utilization projections are inherent to an averaging plan. Thus, averaging plans will include an emissions margin to allow operational flexibility and avoid compliance concerns from small operational perturbations. This will inherently result in lower emissions when using averaging than would occur if complying with prescriptive limits on every unit.

Transco currently complies with both the current Pennsylvania NO_x RACT regulations and NO_x rules for large units through the use of emissions averaging. A review of Transco’s annual ozone season emissions averaging demonstrations since 2005 would clearly support the position that a buffer is inherent when complying with emissions averaging for natural gas transmission sources. Inclusion of a penalty in the Proposed Rule adds an additional and unnecessary margin and is inconsistent with existing PA DEP regulations. Thus, the “0.9 multiplier” should be deleted from the averaging equation.

The averaging equation should also be generalized to allow operators to use engineering units consistent with the type of equipment. For RICE, the emissions obligation is based on a g/bhp-hr emission limit, and those engineering units should be allowed rather than lb/MMBtu. In this case, equipment usage should be based on engine size (hp) and an efficiency conversion (brake-specific fuel usage or Btu/bhp-hr) provided by the operator based on engine specifications. Calculations using “g/bhp-hr” are used for existing PA DEP rules discussed above and should be allowed for this rule. This adds consistency within the rule and consistency with other PA DEP rules that impact these same sources.

C. Emissions averaging should be reconciled annually rather than using a 30-day rolling average and common methods (e.g., periodic testing) should be allowed.

Williams recommends using annual emissions averaging reconciliation rather than a 30-day rolling average. The Proposed Rule reconciles emissions based on a 30-day rolling average, which is unnecessarily restrictive and much more stringent than the PA DEP, EPA, and other state regulatory examples discussed above for emissions averaging compliance for industrial RICE and turbines. While a 30-day rolling average may be relevant in regulations for electric utilities and larger boilers, it is far too burdensome and costly for natural gas transmission operations. The associated implications include higher costs, emissions averaging infeasibility, and the need for additional alternative case-by-case RACT determinations. Williams recommends relying on established procedures in Pennsylvania regulations, the EPA model rule, and other state rules.

These examples rely on annual emissions averaging reconciliation and/or ozone season reconciliation. For natural gas transmission and other industrial sources, the Proposed Rule should be revised to require annual reconciliation, and/or ozone season reconciliation.

The 30-day averaging period may be premised on a scenario applicable for large boilers with other regulations that require CEMS and compliance assurance on this time frame. CEMS are not used at gas transmission facilities, yet emissions averaging is already being effectively implemented in Pennsylvania and other states.

The monitoring requirements are relatively standard, and based on periodic testing occasionally with parameter monitoring, such as quarterly NO_x tests and monitoring of fuel usage. The PA DEP regulations cited above include example regulatory language for calculation and recordkeeping requirements, and similar provisions should be added to the Proposed Rule.

If needed, Williams can provide additional examples of monitoring requirements for emissions averaging for gas transmission. Periodic testing, typically using portable analyzers is common. This approach is appropriate for the affected equipment because combustion-based NO_x controls will be used for lean burn engines and turbines. The emissions performance is inherent to equipment operation, and emissions will not deviate significantly because technology is designed into the system. Emission controls cannot be turned off or by-passed, as is the case for post-combustion emissions control. Portable analyzers are commonly applied for these tests, and in recent years, portable analyzer testing has been added to a number of EPA rules for natural gas-fired RICE and

turbine regulations. Examples include the engine NSPS, turbine NSPS, and RICE NESHAP. In addition to portable methods cited in those rules (e.g., ASTM Method D6522), the January 2013 RICE NESHAP amendments include a portable method as Appendix A³ (for CO measurements required by Subpart ZZZZ). Periodic portable analyzer tests are a reasonable basis to demonstrate emissions levels for the purposes of emissions averaging.

5. For turbines required to comply with an emission standard, the applicability threshold should be increased to 6,000 horsepower.

PA DEP should revise the applicability threshold for turbines required to comply with emission standards to 6,000 hp. If not, an entire class of turbines will be required to submit a request for case-by-case alternative RACT, because retrofit NO_x emission control is not available for smaller turbines. The higher threshold is commensurate with applicability thresholds in EPA and other state's rules, and similar to the threshold for other combustion units in the Proposed Rule with similar or higher emissions.

PA DEP proposes an appropriate NO_x limit of 42 ppmv for natural gas-fired turbines that can retrofit NO_x emission controls. The technology basis is replacement of a standard, diffusion flame combustor with lean premixed combustion. The technical basis for this standard is documented in the 2006 revision to the Turbine NSPS⁴ (Subpart KKKK), which includes a 42 ppmv NO_x standard for reconstructed and modified turbines with a heat input rating from 50 MMBtu/hr to 850 MMBtu/hr. In its response to comments for Subpart KKKK, EPA acknowledges that the 42 ppmv limit is not appropriate for units 50 MMBtu/hr and smaller because lean premixed technology is not available.⁵ The NSPS support documentation also concludes that other technologies are not feasible. Solar Turbines Incorporated is a primary manufacturer of turbines in this size range, and their comments from the Subpart KKKK rulemaking provide additional details.⁶

In addition to Solar units, other manufacturers, including Westinghouse and Dresser Clark, marketed similar sized units that are in the Pennsylvania fleet of existing turbines. As with the small Solar units, these small industrial turbines do not have a retrofit NO_x control option. To accommodate these small turbines that would otherwise require a case-by-case alternative RACT analysis, Williams recommends increasing the applicability threshold for gas-fired turbines subject to a 42 ppmv NO_x standard to 6,000 hp. For consistency within the Proposed Rule, the threshold in §129.97(c)(2) associated with units required to follow good engineering practices should also be revised from 1,000 hp to 6,000 hp.

In addition to consistency with technology limitations, a 6,000 hp threshold is also similar to the applicability threshold in §129.97 for other combustion units with similar or higher emissions than small natural gas-fired turbines. In §129.97(g)(1), a 50 MMBtu/hr threshold applies to process heaters and other combustion units, including units that fire natural gas or other fuels. This heat input-based threshold is similar to a 6,000 hp threshold for turbines. Small gas-fired turbines will have similar levels

³ 78 FR 6674 – 6724

⁴ Standards of Performance for Stationary Combustion Turbines. 40 CFR, Part 60, Subpart KKKK.

⁵ Docket Document No. EPA-HQ-OAR-2004-0490-0322. EPA Memorandum: Response to Public Comments on Proposed Standards of Performance for Stationary Combustion Turbines, Section 1.1 (July 2006).

⁶ Docket Document No. EPA-HQ-OAR-2004-0490-0185. Solar Turbines Incorporated Comments on Proposed Turbines NSPS (April 19, 2005).

of emissions as small gas-fired process heaters / combustion units and will have lower emissions than liquid or solid fueled process heaters / combustion units. Thus, a 6,000 hp threshold for gas-fired turbines addresses inequities that would otherwise exist in the rule.

6. Emission limits should consider technology limitations at reduced load, consistent with federal regulations.

The Proposed Rule includes NO_x emission limits that are based on specific technologies, including NSCR for rich burn RICE, LEC for lean burn RICE, and lean premixed combustion for turbines. The engineering units used for emission standards are important when considering emissions performance across the operating envelope (e.g., at reduced load). For example, mass emissions to the atmosphere (e.g., pounds per hour) may not increase, but emission rates (e.g., g/bhp-hr) may increase at reduced load. For this reason, the Proposed Rule should define the operating requirements (or limitations) for compliance tests, and applicability of emission standards should be limited to those conditions. Recent NSPS provide the technical background that defines these limitations, and the Proposed Rule should be revised to reflect these limitations.

For turbines, lean premixed combustion functions at higher loads, but as load is decreased, combustion characteristics change to maintain combustion stability. For example, a pilot flame may be used to enhance combustion stability at reduced load, and NO_x concentration will increase while the mass rate (lbs/hr) may not. Subpart KKKK did not address this issue in the proposed rule, but EPA received comments and responded appropriately. The July 2006 final rule added requirements that limit applicability of the 42 ppmv limit to 75% or higher load and require a single, high load compliance test. A higher emission limit (150 ppmv) applies at lower load.

Subpart JJJJ includes a similar requirement for lean burn engines, with compliance tests completed at 100% ±10% of maximum load or the highest achievable load. Acknowledgement of this phenomenon is sometimes reflected in permits. There are examples in PA DEP permits for RICE where a nominally higher g/bhp-hr emission rate is allowed at partial load.⁷

The Proposed Rule should be revised to reflect limitations associated with engineering units used for emission standards and associated control technology limitations. Federal NSPS standards should be used as a basis to define these technical limits, with turbine limits applicable at 75% of rated load and higher, and lean burn RICE limits applicable at 90% of rated load and higher.

7. PA DEP should strive to achieve consistency with federal regulations that address the same types of equipment, such as affected source definitions.

The Proposed Rule should strive for consistency with federal regulations for the same types of affected equipment, where appropriate. Examples discussed above include technical documentation from NSPS and NESHAPs that support emissions limits, applicability thresholds, and compliance monitoring tools. For example, federal RICE and turbine rules provide justification for rule requirements such as a higher

⁷ For example, PA DEP permit for Cooper-Bessemer lean burn engines at Columbia Gas Transmission Corporation Renovo Compressor Station.

applicability threshold for turbines subject to a 42 ppmv NO_x standard, and appropriate VOC standards for lean burn engines.

Another example is definitions. Williams recommends the use of common definitions for federal and state rules to eliminate confusion and provide a common compliance framework. Section 121.1 of the Proposed Rule includes a revised definition, shown here with strikethrough and bold underline text to show the proposed changes:

Stationary internal combustion engine – ~~For purposes of § 129.203 (relating to stationary internal combustion engines), an~~ **An** internal combustion engine of the reciprocating type that is either attached to a foundation at a facility or is designed to be capable of being carried or moved from one location to another and is not a mobile air contamination source.

This definition is not consistent with federal regulations such as NSPS, NESHAP that differentiate mobile and stationary source engines. Under federal rules, portable / transportable engines are subject to mobile source “nonroad engine” regulations and not NSPS or NESHAP standards. The Proposed Rule revision broadly applies this “stationary engine” definition to PA DEP rules and would cause implementation confusion. PA DEP should use a definition consistent with federal rules. For example, the Subpart JJJJ definition includes, “...Stationary ICE differ from mobile ICE in that a stationary internal combustion engine is not a nonroad engine as defined at 40 CFR 1068.30...”. The nonroad definition in 40 CFR , §1068.30 includes portable and temporary engines, and nonroad engines include units that are, “...portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.” Thus, transportable engines are not stationary engines under federal regulations, and this conflicts with the §121.1 definition above, where an engine that can be moved is considered stationary.

Equipment definitions and other requirements should comport with federal requirements whenever possible. PA DEP should not define stationary engines differently than federal rules.

8. The Proposed Rule intends to reduce paperwork associated with case-by-case RACT determinations, but that objective will not be achieved unless emission limits, compliance options, and scheduling issues discussed in these comments are addressed.

The previous PA DEP RACT rule required case-by-case review for affected units, resulting in significant burden for both the agency and affected sources, as well as EPA. The Proposed Rule includes emission limits and emissions averaging to reduce that burden. However, as discussed in these comments, a significant paperwork burden will still occur unless revisions are completed. For example, under the Proposed Rule, PA DEP will potentially receive more than 100 more alternative RACT determinations from the natural gas transmission industry for VOC emission limits, alternative NO_x RACT determinations for small gas-fired turbines without access to retrofit lean premixed combustion control, determinations that emissions averaging can be implemented because prescribed limits are not achievable, and finally, schedule extension requests (up to 3 years) for all natural gas transmission facilities that require installation of controls. As discussed in Comment 2, three years is inadequate to complete emissions control implementation when multiple facilities and dozens of units are affected, so

there would also be additional petitions required to extend schedules beyond the 3-year maximum allowed by the rule.

Williams supports efforts to develop a rule that provides flexibility and minimizes the need for case-specific determinations. Therefore, Williams recommends the revisions discussed in these comments, which would accomplish this goal by reducing the paperwork burden for both PA DEP and operators.

9. The Proposed Rule preamble and RAF include limited information and make inaccurate conclusions.

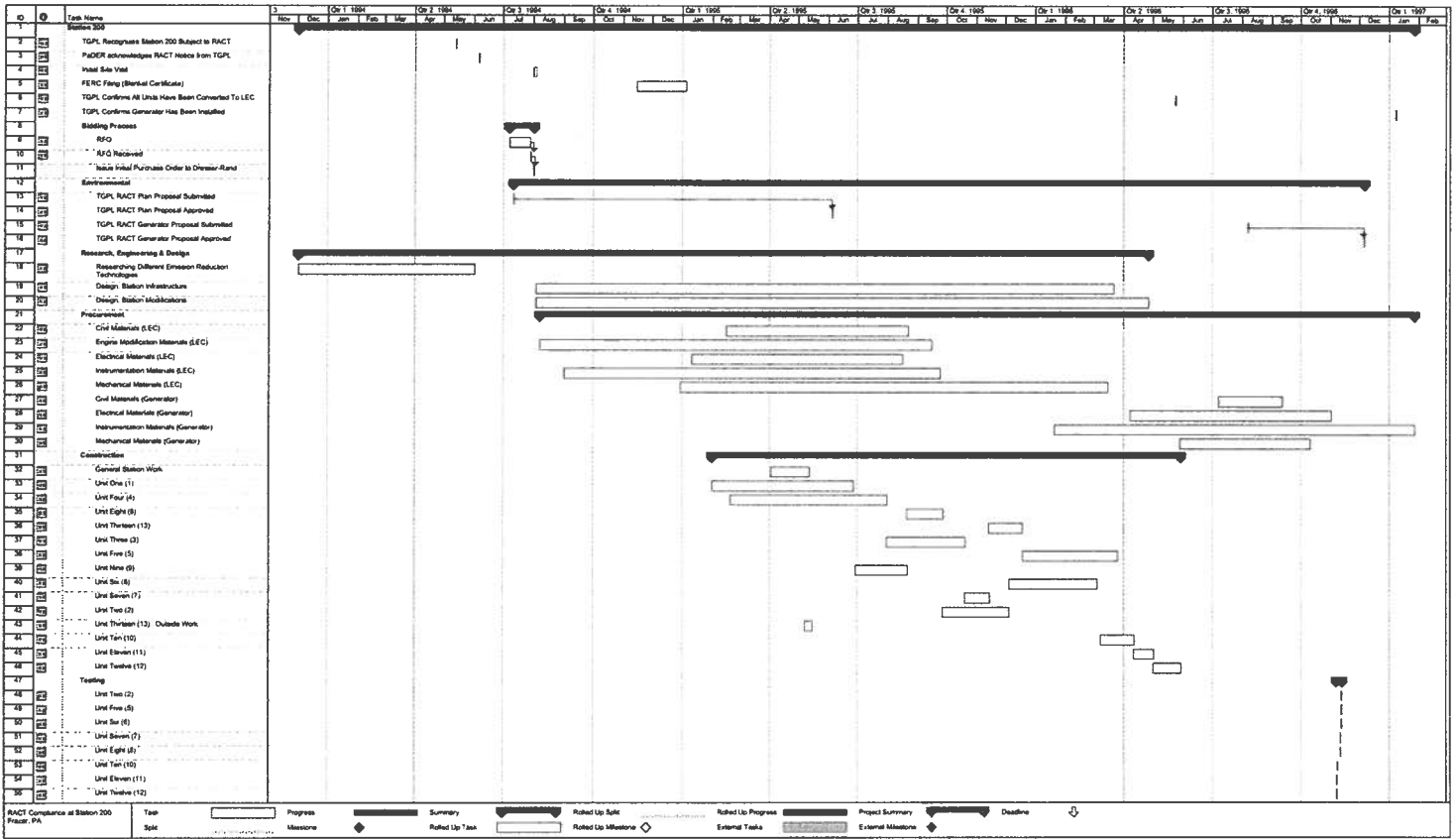
PA DEP should provide additional support to justify the need for the Proposed Rule. Throughout this document, Williams has addressed the lack of support for PA DEP's conclusions in the Proposed Rule. In summary, PA DEP's proposal significantly under-estimates the number of affected units, relies on limited information regarding the basis for proposed emission limits, and makes inaccurate conclusions regarding whether VOC reductions would require new control technology. The PA DEP's proposal lacks a basis for estimates of total reductions in NO_x or VOCs and does not accurately assess the costs and benefits resulting from rule implementation. Finally, the Department should consider the applicability of emissions control technology and technology performance for various types of affected equipment.

Williams recommends that PA DEP revise the analysis and support documentation in the preamble and RAF. PA DEP should provide additional support and analysis to justify the regulation and requirements applicable to each equipment category. In some cases, Williams may be able to provide additional information associated with emissions, control technology performance, and retrofit control costs associated with RICE and turbines. Williams welcomes additional dialogue on these topics.

CONCLUSIONS

Williams believes that emission reductions can be achieved, but PA DEP must revise the Proposed Rule to consider technical and economic feasibility, and to define reasonable schedules. The RAF should be revised to more adequately reflect the number of affected units, assess whether emissions control would be required to meet proposed standards, assess the technical and economic feasibility of installing retrofit controls on existing equipment, and investigate schedule implications. Williams offers its assistance to reconcile the issues herein and facilitate the development of viable, effective, and reasonable RACT requirements for natural gas-fired reciprocating engines and turbines.

Attachment 1 - Example NOx RACT Project Timeline - Transco Station 200



Proposed Revisions to 25 PA Code, Chapters 121 and 129, PA Bulletin, Vol. 44, No. 16 (April 19, 2014)
Additional RACT Requirements for Major Sources of NO_x and VOCs,
Summary of Comments Submitted to Environmental Quality Board by
The Williams Companies, Inc.

Comments submitted to the Environmental Quality Board by The Williams Companies, Inc. address the proposed requirements for control of nitrogen oxides (NO_x) emissions and volatile organic compound (VOC) emissions from stationary natural gas fired reciprocating internal combustion engines and stationary natural gas fired turbines. Williams' Transcontinental Gas Pipe Line Company, LLC operates engines and turbines to compress natural gas through its pipeline system for delivery to residential, commercial, industrial and electrical generation customers in Pennsylvania and beyond. Requirements in the proposed Pennsylvania Department of Environmental Protection (PA DEP) regulations would impact approximately forty (40) existing natural gas engines and/or turbines at six (6) Transco natural gas compressor stations.

Williams shares PA DEP's desire to reduce the burden associated with case-by-case RACT analysis, but several issues must be addressed to achieve that objective. Primary issues include:

- 1) The Proposed Rule significantly under-estimates the number of affected units that would require installation of NO_x or VOC control technology. Industry estimates that approximately 150 units operated by natural gas transmission companies would be affected by the rule; this exceeds the PA DEP estimate for all affected source types statewide. Thus, the rule would have significant impact on natural gas transmission company operations. The Proposed Rule would impose many requirements to install control technology; those associated costs are significantly under-estimated by the Department.
- 2) The compliance schedule in the Proposed Rule is not feasible. The schedule requires compliance within one year, with an option to request an extension of up to three years to comply. Due to the large number of affected units, there are significant scheduling implications which could impact the reliability of gas delivery. Based upon Williams' historical experience with emission reduction projects, an implementation timeline of more than three years is required to comply. The regulation should allow operators to develop a plan – subject to Department review and approval – to establish the compliance schedule for affected equipment.
- 3) The VOC emission standards for engines and turbines should be deleted, or replaced with a compliance option based on good combustion practices. The PA DEP Regulatory Analysis Form inappropriately assumes that no additional emission controls would be required – and thus does not further assess implications. The proposed VOC emission standards would accomplish minimal reductions at a very high cost.
- 4) The applicability threshold for turbines required to comply with emission standards should be revised to 6,000 horsepower (hp). If not, an entire class of turbines would be required to request case-by-case alternative RACT because retrofit emission control is not available for smaller turbines.
- 5) Williams supports including emissions averaging in the Proposed Rule. Companies should have the option to comply with either the unit-specific emission limit or through the use of emissions averaging – without first having demonstrated that the unit-specific limit cannot be met for the affected units.

Williams believes that emission reductions can be achieved, but PA DEP must revise the Proposed Rule to consider technical and economic feasibility and to define reasonable schedules. Therefore, Williams recommends that the Environmental Quality Board withdraw the proposed regulation until PA DEP can address these comments and prepare a revised Regulatory Analysis Form. Williams offers the Department its assistance to reconcile the issues identified herein and to facilitate the development of viable, effective, and reasonable RACT requirements for natural gas-fired reciprocating engines and turbines.

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