pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

MEMO

TO Muhammad Q. Zaman *MQZ*
Environmental Program Manager
Air Quality Program

FROM Benjamin Hankins *BDH*
Air Quality Engineer
Air Quality Program

THRU Daniel C. Husted, P.E. *DCH*
Chief, Facilities Permitting Section
Air Quality Program

DATE November 1, 2023

RE Transcontinental Gas Pipe Line Company, LLC
Compressor Station 520 (Salladasburg)
TVOP 41-00001
Mifflin Township, Lycoming County

Procedural History

As part of the Reasonably Available Control Technology (RACT) regulations codified at 25 Pa. Code §§ 129.111—129.115 (relating to additional RACT requirements for major sources of NO_x and VOCs for the 2015 ozone NAAQS) (RACT III), the Pennsylvania Department of Environmental Protection (Department) has established a method under § 129.114(i) (relating to alternative RACT proposal and petition for alternative compliance schedule) for an applicant to demonstrate that the alternative RACT compliance requirements incorporated under § 129.99 (relating to alternative RACT proposal and petition for alternative compliance schedule) (RACT II) for a source that commenced operation on or before October 24, 2016, and which remain in force in the applicable operating permit continue to be RACT under RACT III as long as no modifications or changes were made to the source after October 24, 2016. The date of October 24, 2016, is the date specified in § 129.99(i)(1) by which written RACT proposals to address the 1997 and 2008 8-hour ozone National Ambient Air Quality Standards (NAAQS) were due to the Department or the appropriate approved local air pollution control agency from the owner or operator of an air contamination source located at a major NO_x emitting facility or a major VOC emitting facility subject to § 129.96(a) or (b) (relating to applicability).

The procedures to demonstrate that RACT II is RACT III are specified in § 129.114(i)(1)(i), 129.114(i)(1)(ii) and 129.114(i)(2), that is, subsection (i), paragraphs (1) and (2). An applicant may submit an analysis, certified by the responsible official, that the RACT II permit requirements remain RACT for RACT III by following the procedures established under subsection (i), paragraphs (1) and (2).

Paragraph (1) establishes cost effectiveness thresholds of $7,500 per ton of NO_x emissions reduced and $12,000 per ton of VOC emissions reduced as ‘‘screening level values’’ to determine the amount of analysis and due diligence that the applicant shall perform if there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis. Paragraph (1) has two subparagraphs.

Subparagraph (i) under paragraph (1) specifies that the applicant that evaluates and determines that there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis and that each technically feasible air cleaning device, air pollution control technology or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the Department (or appropriate approved local air pollution control agency) under § 129.99(e) had a cost effectiveness equal to or greater than $7,500 per ton of NO_x emissions reduced or $12,000 per ton of VOC emissions reduced shall include the following information in the analysis:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.
- A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II.
- A summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology or technique in the previous bullet and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology or technique as submitted previously under RACT II.
- A statement that an evaluation of each economic feasibility analysis summarized in the previous bullet demonstrates that the cost effectiveness remains equal to or greater than $7,500 per ton of NO_x emissions reduced or $12,000 per ton of VOC emissions reduced.

Subparagraph (ii) under paragraph (1) specifies that the applicant that evaluates and determines that there is no new pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis and that each technically feasible air cleaning device, air pollution control technology or technique evaluated for the alternative RACT requirement or RACT emission limitation approved by the Department (or appropriate approved local air pollution control agency) under § 129.99(e) had a cost effectiveness less than $7,500 per ton of NO_x emissions reduced or $12,000 per ton of VOC emissions reduced shall include the following information in the analysis:

- A statement that explains how the owner or operator determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available.
- A list of the technically feasible air cleaning devices, air pollution control technologies or techniques previously evaluated under RACT II.
- A summary of the economic feasibility analysis performed for each technically feasible air cleaning device, air pollution control technology or technique in the previous bullet and the cost effectiveness of each technically feasible air cleaning device, air pollution control technology or technique as submitted previously under RACT II.
- A statement that an evaluation of each economic feasibility analysis summarized in the previous bullet demonstrates that the cost effectiveness remains less than $7,500 per ton of NO_x emissions reduced or $12,000 per ton of VOC emissions reduced.
- A new economic feasibility analysis for each technically feasible air cleaning device, air pollution control technology or technique.

Paragraph (2) establishes the procedures that the applicant that evaluates and determines that there is a new or upgraded pollutant specific air cleaning device, air pollution control technology or technique available at the time of submittal of the analysis shall follow.

- Perform a technical feasibility analysis and an economic feasibility analysis in accordance with § 129.92(b) (relating to RACT proposal requirements).
- Submit that analysis to the Department (or appropriate approved local air pollution control agency) for review and approval.

The applicant shall also provide additional information requested by the Department (or appropriate approved local air pollution control agency) that may be necessary for the evaluation of the analysis submitted under § 129.114(i).

Facility details

Transcontinental Gas Pipe Line Company, LLC (Transco) owns and operates an interstate natural gas pipeline transmission system extending from Texas to the Northeast United States. Located in Mifflin Township, Lycoming County, Pennsylvania, Transco Station 520 is a compressor station driven by natural gas-fired reciprocating internal combustion engines (RICE), turbines, emergency generators, and other combustion units. The facility currently operates under Title V Operating Permit (TVOP) 41-00001, which was issued by the Department, in accordance with the provisions of the Title 25 Pennsylvania Code Chapter 127, on May 5, 2020. The Station has a potential to emit (PTE) greater than 50 tons per year (TPY) of volatile organic compounds (VOC) and 100 tons per year of oxides of nitrogen (NOx). As such, the Station is subject to updated reasonably available control technology (RACT III) requirements as promulgated in 25 Pa. Code § 129.111-129.115.

Sources at this facility have previously been subject to RACT analyses. A RACT II plan for Compressor Station 520, which included case-by-case NOx RACT determinations for combustion turbines P106 and P107, was developed and applied to the facility in accordance with 25 Pa. Code § 129.96-129.100 on June 6, 2017. The RACT II plan was approved by EPA and incorporated into the Pennsylvania State Implementation Plan (SIP) on October 19, 2020. Please see the *Federal Register 85 FR66263* for publication of the approval and incorporation into the PA SIP. The case-by-case RACT II analysis for P106 and P107 was for NOx emissions only. These turbines are capable of meeting the presumptive VOC emission limits specified in 25 Pa. Code §§ 129.97(g)(2)(iv)(C) and 129.112(g)(2)(v)(B).

No modifications or changes have been made to the case-by-case RACT affected sources (P106 and P107) at the facility since October 24, 2016. On December 29, 2022, Transco submitted a RACT III application to the Department proposing that the case-by-case RACT II determination for combustion turbines P106 and P107 also satisfies the RACT III requirements pursuant to 25 Pa. Code § 129.114(i).

Sources subject to § 129.114(i) - RACT II determination assures compliance with RACT III requirements

Source ID	Source Name	RACT III provision
P106	Solar Mars Turbine 1 (12,600 HP)	§ 129.114(i)(1)(i)
P107	Solar Mars Turbine 2 (12,600 HP)	§ 129.114(i)(1)(i)

The RACT II determination/requirements can be found in the attached RACT II review memo and at the following link:

EPA Approved Pennsylvania Source-Specific Requirements | US EPA

RACT III analysis performed by the Department under § 129.114(j)(1):

To satisfy the § 129.114(i)(1)(i)(A) requirement to explain how they determined that there is no new pollutant specific air cleaning device, air pollution control technology or technique available, Transco referred back to their RACT II analysis for the control of NOx emissions from combustion turbines P106 and P107. In their RACT II analysis, Transco evaluated Dry Low NOx (DLN) combustor technology, water/steam injection, selective catalytic reduction (SCR), selective non-catalytic reduction (SNCR), Rich/Quench/Lean combustion, catalytic combustion – Xonon™, catalytic adsorption – SCONOX™, and alternate fuel containing lower fuel-bound nitrogen. The analysis concluded that of the identified technologies, only DLN and SCR were technically feasible. The details of the technical feasibility analysis from RACT II are re-iterated in the subject application for reference. Transco contends that the technical feasibility determination remains accurate for the sources and that no new technologies have become available to reduce NOx emissions from gas turbines. To support this determination, Transco conducted a search of the US EPA NSR website, the US EPA RACT, BACT, LAER Clearinghouse (RBLC) which yielded that no new control methods have become available since their RACT II review in 2017. Transco reportedly also evaluated various state air quality regulations and websites, control technology vendors' information, technical books and articles, and state and federal guidance documents to determine whether there were any new NOx control technologies that were not identified during the 2017 RACT II review. Transco reports that no new pollution control technologies or techniques applicable to the combustion turbines are available and therefore the only technically feasible control options in this case are Dry Low NOx combustor technology and Selective Catalytic Reduction.

The Department has reviewed source information, control technologies or measures evaluated by Transco. The Department also performed an independent analysis which included, the Department's continuous review of permit applications since the applicability date of RACT II, internet searches, BACT/RACT/LAER Clearinghouse search, knowledge gained from the Department permitting staff participating in technical presentations by several vendors and manufacturers of pollution control technology, and a review of EPA and MARAMA's documents. Based on our review of these documents, along with training and the expertise of the reviewing staff, the Department concludes that there are no new or updated air pollution control technologies available for the Solar Mars combustion turbines found at Compressor Station 520 and determines that RACT II requirements for Source IDs P106 and P107 at Compressor Station 520 listed in the table assure compliance with requirement for RACT III for the § 129.111 - § 129.115.

As part of the 2017 case-by-case NOx RACT II analysis for combustion turbines P106 and P107, Transco conducted economic feasibility analyses for the two technologies that were determined to be technically feasible. The results of the economic analyses are summarized in the table below.

Source ID	Source Name	Control Technology	NOx Emissions Before Control	NOx Emissions After Control	Total Annual Cost of Control Equipment	NO_x ($/Ton)
P106	Solar Mars Turbine #1	DLN				12,545

P106	Solar Mars Turbine #1	SCR				17,234
P107	Solar Mars Turbine #2	DLN				11,100
P107	Solar Mars Turbine #2	SCR				14,959

The economic feasibility analyses performed by Transco on Dry Low NOx and Selective Catalytic Reduction technologies pursuant to 25 Pa. Code § 129.99(e) demonstrates that the calculated cost effectiveness was greater than $7,500 per ton of NOx emissions reduced. Pursuant to 25 Pa. Code § 129.114(i)(1)(i), Transco provided the economic feasibility information, which is summarized in the Table above, showing that the cost effectiveness for technically feasible controls remains equal to or greater than $7,500 per ton of NOx emissions reduced. Therefore, these controls are not considered to be economically feasible as RACT. The subject RACT III application contains copies of the economic analyses in full detail which can be referred to for more specifics on the cost information. The economic analysis for Dry Low NOx technology is based on the projected remaining life of the existing turbine cores, which is another 10-15 years based on the operational history of these units. In the event Transco proposes to replace the cores in these combustion turbines 10-15 years from now, the Department will require the replacement cores to be lower emitting cores which utilize Dry Low NOx or equivalent (or better) technology that is available at that time.

Public discussion

No discussions occurred with the EPA, the company, or the public beyond the initial application, which materially impacted a decision to include one or more sources under the RACT II is RACT III umbrella.

Conclusion

The Department has analyzed the applicant's proposal for considering RACT II requirements as RACT III and also performed independent analysis. Based on the information provided by the applicant or owner/operator of the facility and independently verified by the Department, the Department determines that the RACT II requirements satisfy the RACT III requirements. The RACT III requirements are identical to the RACT II requirements and are as stringent as RACT II.

File: Transcontinental Gas Pipe Line Co LLC, Permits, TVOP, 41-00001
Cc: Central Office, Air Quality Permits
US EPA Region III