COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection
Southwest Regional Office

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DATE November 9, 2023

RE Review Memorandum of Reasonably Available Control Technology (RACT) III Proposal
Vandergrift Facility
ATI Flat Rolled Products Holdings, LLC.
Vandergrift Boro., Westmoreland County

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

The ATI Vandergrift facility is a specialty materials finishing facility. The principal products produced at Vandergrift are finished specialty strip. In general, finishing operations include annealing, pickling and cold rolling. Annealing is the process of altering the properties of the product by subjecting it to controlled thermal cycles with moderate peak temperatures. Annealing relieves thermal and mechanical stresses induced by the rolling operations and softens the product to improve its formability. Mixed Acid Pickling is a cleaning process for specialty products; mixed acid (nitric and hydrofluoric acids) dissolve and chemically remove oxidized metal and other materials from the product.

ATI is the owner and operator of the Vandergrift facility which is an existing specialty metals finishing facility. Current finishing operations at the facility primarily include two boilers, two pickling and annealing lines, and two cold reduction mills. The facility is a Title V facility due to the major source levels of oxides of nitrogen (NO_x).

Recent changes in the facility

No modifications or changes were made to the sources subject to RACT after October 24, 2016. However, the Department authorized a plan approval on May 28, 2021 ATI Flat Rolled Products Holdings, LLC (ATI). ATI is proposing to upgrade the facility which includes modifications to the existing No. 91 Anneal and Pickle Line as well as installation of a new operating line and a new cleaning line. In addition to the No. 91 Line modifications, ATI is also proposing to install a Bright Anneal Line (BA) which will consist of a 17.7 MMBtu/hr Atmospheric Muffle furnace, hot water degreasing, and a passivation section. A cleaning line, hood anneal furnace, and ancillary equipment are also proposed. The proposed sources are under construction but are not part of this review.

Table below showing existing as well as proposed list of Air Contamination Sources and Air Cleaning Devices. Proposed sources are highlighted orange and are in bold font.

Source ID	Source Name	Unit Type[1]	Status	Capacity	Associated Control Device ID	Associated Control Device Name	Associated Stack ID	Associated Stack Nar
031	Boiler No. 1	CU	Existing				S031	Boiler 1 Stack
032	Boiler No. 2	CU	Existing				S032	Boiler 2 Stack
033	Cleaver Brooks Boiler No. 3 (NG) (Model: TBD)	CU	Proposed	7 MMBtu/hr			S033	Boiler 3 Stack
103	Z-8 Mill	P	Existing		C103	Z-8 Mill Candle Filter	S103	Z-8 Z-Mill Stack
108	66” Temper Mill	P	Existing				Z108	Temper Mill Fugitive
112	Cooling Tower # 1	P	Existing				Z112	Cooling Tower 1
113	Paved Roads	P	Existing				Z113	Paved Road Fugitive
114	Z-9 Mill	P	Existing		C114	Z-9 Mill Candle Filter	S114	Z-9 Z-Mill Stack
115	Cooling Tower # 2	P	Existing				Z115	Cooling Tower 2
116	Miscellaneous Space Heaters	CU	Existing				Z116	Misc Space Heaters
118	Emergency Generator (Model TBD)	P	Proposed	500 kw (362 gallons of diesel fuel)			S118	Emergency Generator Sta
120A	90 Line Annealing Furnaces	P	Existing				S120A	90 Line Annealing Furnace E
120B	90 Line Shotblast	P	Existing		C120B	90 Line Shotblast Baghouse	S120B	90 Line Shotblast Exhau
120C	90 Line H2SO4 Pickling	P	Existing		C120C	90 Line H2SO4 Pickling Scrubber	S120	90 Line Scrubber Exhau
120D	90 Line HF/HNO3 Pickling	P	Existing		C120D	90 Line HF/HNO3 Pickling Scrubber	S120	90 Line Scrubber Exhau
120E	90 Line Strip Dryer	P	Existing				Z120E	90 Line Strip Dryer
121A	91 Line Strip Dryers (1 and 2 Combined)	P	Existing				Z121A	91 Line Strip Dryers
121B	91 Line Annealing Furnace (42 mmbtu/hr)	P	Existing				S121B	91 Line Annealing Furnace
121C	91 Line Kolene Descaling (Model TBD)	P	Proposed[2]	35 tons/hr Average	C121C	17, 250 ACFM No 91 Line Kolene Descaling Scrubber	S121C	No. 91 Line Kolene Scrubber
121G	No. 91 Tri-Mer Line Sulfuric Acid Pickling (Model TBD)	P	Proposed	35 tons/hr Average	C121G	3,715 ACFM No. 91 Line Sulfuric Acid Scrubber	S121G	No. 91 Line Sulfuric Acid Sc Stack
121E	91 Line HF/HNO3 Pickling	P	Existing		C121E	No. 91 Line Nitric/HF Pickling Scrubber	S121E	91 Line HF/HNO3 Scrubber
121F	No. 91 Line Kolene Heater (Model TBD)	P	Proposed	8 MMBtu/hr (68.04 mmcf annual)			Z121F	Kolene Heater Fugitive
122A	Cleaning Line Alkaline Degreasing (Make/Model: TBD)	P	Proposed	10,400 tpy (2 ton/hr average)			S122A	Cleaning Line Alkaline Degr Stack
122B	Cleaning Line Pickling (Make/Model: TBD)	P	Proposed	10,400 tpy (2 tons/hr average)	C122B	2,500 SCFM Water Wash Scrubber	S122B	Cleaning Line Pickling Scr Stack
123A	Bright Anneal Alkaline Degreasing (Make/Model: TBD)	P	Proposed	53,000 tpy (6 tons/hr average)			S123A	Bright Anneal Alkaline Degr Stack
123B	Bright Anneal Furnace (with Ebner Burner(s)) (Model: TBD)	P	Proposed	17.7 MMbtu/hr (150.54 mmcf annual)			S123B	Bright Anneal Furnace St
123C	Bright Anneal Passivation (Make/Model: TBD)	P	Proposed	53,000 tpy (6 tons/hr average)			S123C	Bright Anneal Passivation S
124	Hood Anneal Furnace (Make/Model: TBD)	P	Proposed	3.6 MMbtu/hr (30.62 mmcf annual)			Z124	Hood Anneal Furnace Fug

125	Cooling Tower No. 3 (Make/Model: TBD)	P	Proposed	Recirculation Rate: 792.5 gpm			Z125	Cooling Tower No. 3 Fugi
111	Parts Cleaners (maintenance)	I	Existing					
	Lime Silo	I	Existing					
	TSP/BS100 Silo	I	Existing					
	AST 028A	I	Existing					
	Misc. Paint Usage (Maintenance)	I	Existing					

1. "Unit Type" Key: "P" = Process; "CU" = Combustion Unit; "I" = Insignificant Source
2. C121G is an existing scrubber at the facility. The flow rate was not included in the application. Looking at past documentation, a review memo dated July 19, 2000 states, "The ESS unit exhausts gas at 3,600 ACFM". From a 1996 stack test, the average flow rate was 3,715ACFM and 3,433 SCFM. The Department is using 3,715 ACFM as worst-case scenario.
3. Source 121C is existing equipment that is currently listed as inactive. This application proposes to bring 121C back online with modifying from ESS to Kolene. Treated as a new source. C121C is 17,250 ACFM. The Department calculated SCFM to be 14,975 SCFM.

ATI Vandergrift facility is a major source of NO_x and is not a major source of VOC. The requirements § 129.112—129.115 apply Statewide to the owner and operator of a major NO_x and VOC emitting facility that commenced operation on or before August 3, 2018 for which a requirement or emission limitation, or both, has not been established in § § 129.51, 129.52(a)—(k) and Table I categories 1—11, 129.52a—129.52e, 129.54—129.63a, 129.64—129.69, 129.71—129.75, 129.77 and 129.101—129.107.

The initial Title V Operating Permit (TVOP) was issued on July 31, 2002, with an expiration date of July 30, 2007. The combined third renewal of TVOP and RACT II modification was issued on March 11, 2020 with an expiration date of March 11, 2025. On December 23, 2022, the Department received an initial RACT III notification from ATI Vandergrift which includes a proposal to comply with RACT III requirements.

Presumptive RACT

The following units are natural gas-fired boilers or natural gas-fired combustion sources with a rated heat input capacity <20 MMBtu/hr, emergency standby engines operating less than 500 hours per year, and/or sources with NOx potential to emit <5 tons per year. These units will comply with the Presumptive RACT requirement pursuant to §129.112(c); operate in accordance with manufacturer's specifications and good operating practices. Please note that the requirement to operate in accordance with manufacturer's specifications and good operating practices is an existing Title V/RACT and/or Plan Approval Permit requirement for these sources.

Source ID	Description	Rated Capacity
116	Misc Space Heaters	<20 MMBTU/hr each
033	Boiler No. 3	7 MMBtu/hr
121F	No. 91 A&P - Kolene Heater	8 MMBtu/hr
123B	BA Furnace (*startup CY2023*)	17.7 MMBtu/hr
124	Hood Anneal Furnace (*startup CY2023)*	3.6 MMBtu/hr

The following units are natural gas-fired combustion units with rated heat input capacities equal to or greater than 20 MMBtu/hr each and less than 50 MMBtu/hr. These units will comply with the Presumptive RACT requirement pursuant to §129.112(b); biennial combustion tune-up. Please note that *annual* RACT tune-ups and inspections are existing Title V/RACT Permit requirements for these sources.

Source ID	Description	Rated Capacity
031	No. 1 Boiler	26.1 MMBTU/hr
032	No. 2 Boiler	26.1 MMBTU/hr
121B	No. 91 A&P - Annealing Furnace	42 MMBTU/hr

Alternative RACT Proposal

A RACT II case-by-case analysis was performed on No. 90 A&P Annealing Furnace, No. 90 A&P HNO_3/HF Pickling, and No. 91 A&P HNO_3/HF Pickling and approved by PA DEP. The RACT II case-by-case analysis results were incorporated into the Title V Permit. The Department has reviewed source information, control technologies or measures evaluated by ATI. 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 sources found at ATI and determines that RACT II requirements for the sources below assure compliance with requirement for RACT III for the § 129.111 - § 129.115. In addition, the No. 90 A&P Annealing Furnace and the No. 91 A&P Annealing Furnace undergo

RACT combustion tune-ups/inspections annually (existing Title V requirements) and NOx is tested annually using a portable analyzer.

The RACT II determination/requirements can be found at the following link: EPA Approved Pennsylvania Source-Specific Requirements | US EPA (https://www.epa.gov/sips-pa/epa-approved-pennsylvania-source-specific-requirements.) The RACT II was approved by EPA on 1/25/2022, 87 FR 3670.

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

In accordance with proposed Air Quality Regulations of the Pennsylvania Department of Environmental Protection (PADEP), major sources of Volatile Organic Compounds (VOC) and/or Oxides of Nitrogen (NO_x) are required to submit a Proposal to achieve Reasonably Available Control Technology (RACT) on specified sources of VOC and/or NO_x. Proposed regulations in 25 PA Code §129.114 and §129.115 require that a RACT Proposal and/or notification be submitted for certain sources by December 31, 2022.

At the Vandergrift Facility of ATI Flat Rolled Products Holdings, LLC (ATI), three (3) sources of NO_x were evaluated as RACT II equals RACT III under § 129.114(i)(1)(i):

No. 90 Anneal and Pickling (A&P) Line Annealing Furnace
No. 90 A&P Line Mixed Acid Pickling
No. 91 A&P Line Mixed Acid Pickling.

Under RACT II, applicable control technologies were identified, technically infeasible options were eliminated, remaining technologies were ranked by control effectiveness, and the total and incremental cost effectiveness for each remaining control option was determined.

Based on the results of the top-down analyses, it was concluded that No. 90 A&P Line Annealing Furnace, No. 91 A&P Line Annealing Furnace, No. 90 A&P Line Mixed Acid Pickling, and No. 91 A&P Line Mixed Acid Pickling processes satisfy RACT requirements under present operating conditions.

Air Contamination Sources with Potential to Emit NOx

Source ID	Description	Rated Capacity	Potential to Emit (TPY)
120A	No. 90 A&P - Annealing Furnace	50.5 MMBTU/hr	26
120D	No. 90 A&P - HNO_3/HF Pickling	40 tons/hr	103
121E	No. 91 A&P - HNO_3/HF Pickling	35 tons/hr	57.4

TECHNICAL AND ECONOMIC ANALYSES OF NO_x CONTROL OPTIONS

The principal methodology employed for case-by-case analysis is patterned after the "Guidance Document on Reasonably Available Control Technology for Sources of NO_x Emissions." There are two (2) major phases of analyses incorporated into the top-down review of control options.

First is a review of available control options to determine their feasibility for application to specific individual sources and the associated control effectiveness. Among the factors taken into consideration in determining technological feasibility are temperature requirements/limitations, potential for fouling, installation space limitations and creation of additional environmental liabilities such as secondary pollutants or new waste streams.
Only the control options that were judged to be technologically feasible were analyzed for economic feasibility. This was the second major phase of the top-down approach. The principal activities during this phase were estimating the capital and operating costs for incorporating each control option into each applicable source. Cost information was obtained from the technology references and budgetary vendor quotations were obtained for selected items of control equipment and detailed construction estimates were prepared.

Calculations of annualized total costs for control options were developed in accordance with the PADEP Guidelines and the cost control manual of EPA's OAQPS. By dividing the annualized total costs by the estimated annual reduction in NO_x, the "total cost effectiveness" of each option was computed. Incremental cost effectiveness ratios were calculated and reported.

The calculated total cost effectiveness was compared with the regulatory cost effectiveness threshold to determine the economic feasibility of each option. In accordance with the PA DEP RACT Il Document "Responses to Frequently Asked Questions" (question #41) the regulatory threshold for NOx control is $3,500/ton. For RACT IlI, in accordance with the PA DEP proposed regulation in §129.114, the regulatory threshold for NOx control is $7,500/ton. If the calculated cost effectiveness exceeded this threshold value, the control option was determined to be economically infeasible, therefore, beyond RACT. The economic comparison of costs versus the threshold proceeded from the top-listed control option to lower listed options. The top-down process was continued until a control option was evaluated as both technologically feasible and cost effective, or until no options were found to be feasible and cost effective.

Description of Available NO_x Control Technologies

Technologies for controlling NO_x emissions from various steel making processes can be divided into three basic categories: 1) combustion modifications; 2) post-combustion or post-process modifications; and 3) post-process controls.

1) Combustion Modifications:

- Low excess air (LEA) operation
- Low-NO_x burners (LNB)

- Low-NO_x burners plus flue gas recirculation (FGR) 2) Post-Combustion or Post-

Process Modifications:

- Selective catalytic reduction (SCR) • Selective non-catalytic reduction (SNCR) 3)

Post-Process Controls:

- Hydrogen-peroxide Injection
- Absorption with chemical reaction
- Absorption

Combustion Modifications:

Low Excess Air (LEA) Operation

LEA operation inhibits NO_x formation by reducing excess air levels. Since NO_x formation at furnace conditions is strongly influenced by oxygen availability, reducing the local flame concentration of oxygen reduces NO_x formation. LEA typically provides relatively low NO_x reductions and is relatively easy to implement. It can be implemented alone but is almost always included when other combustion modifications are implemented. Some important factors which can affect application of LEA to a given combustion process include the condition and age of existing burners and control systems and variability of load swings.

From an economic standpoint, it is desirable to maintain minimum excess air since providing excessive amounts of air increases the heat losses in the flue gases, thereby increasing fuel consumption. In general, ATI furnace atmospheres must be controlled to promote the required scale formation based on the product type being processed. Therefore, LEA operation is not a feasible NOx control option.

Low-NO_x Burners (LNB)

LNBs control NO_x formation by carrying out combustion in stages and either the air or the fuel can be added in stages. Compared to standard burners, the combustion process is prolonged. The flame has a chance to radiate heat (and thereby cool) before combustion is complete, which reduces NO_x formation. The most commonly applied type of LNB is a staged air design with low turbulence, less-than-stoichiometric combustion in the primary zone. One or more zones of additional air introduction with the burner provide air staging within the flame envelope and complete combustion. The end result is generally an increase in flame length over that produced by a standard burner, so applicability is limited to furnaces with adequate dimensions. Staged air burners can be fitted with FGR connections or designed so furnace gases are induced into the flame.

In contrast, a staged fuel LNB applies all the air in the initial mixing zone with only part of the fuel, so that the initial flame is relatively cool and NO_x formation is limited. After some heat has been absorbed by the furnace, the remaining fuel is added through high velocity nozzles positioned around the perimeter of the burner. This promotes rapid mixing and entrains furnace gases into the flame, which provides the benefits of FGR. Staged fuel burners generally have a more compact flame than staged air types. One possible drawback is that in contrast to staged air burners, staged fuel burners are only applicable to installations using gaseous fuel because of the need for high pressure second stage fuel injection.

LNBs provide moderate NO_x reductions. A negative side effect of low NO_x burner combustion may be an increase in CO emissions due to low excess air levels, cooler flames, and relatively lower turbulence.

Flue Gas Recirculation (FGR)

FGR decreases the peak flame temperature by increasing the inert gaseous components in the flame (i.e., by "diluting" the heat released from combustion) and reduces the oxygen availability in the flame both of which reduce thermal NO_x formation. However, the reduction in flame temperature is dependent on the temperature of the recycled flue gas; this reduces the effectiveness of this control method as the flue gas temperature increases. It is implemented only as part of a LNB retrofit (since burners must be designed for FGR) and provides relatively small additional NO_x reductions.

Post-Combustion or Post-Process NO_x Reduction Technologies:

Selective catalytic reduction (SCR) and Selective non-catalytic reduction (SNCR)

Post-combustion or post-process NO_x reduction technologies involve injecting a chemical reagent into the flue gas stream to reduce the NO_x that has already been formed. This contrasts with combustion techniques that are focused on controlling the initial formation of NO_x. The chemical reaction between the reagent and NO_x selectively reduces NO_x to molecular oxygen and nitrogen.

The reduction reaction can take place in the presence of a metal oxide or ceramic composite catalyst that promotes this reaction and is termed Selective Catalytic Reduction (SCR). SCR provides a relatively high potential for NO_x destruction (up to 90% NO_x removal). An aqueous ammonia solution or anhydrous ammonia is used as the reducing agent and is injected into the gas stream upstream of the catalyst grid, usually with compressed air as a carrier gas to assist in mixing and penetration. Major hardware components of the system include the catalyst grid, ammonia storage, flow control and metering station, and controls.

The optimal temperature range for the reduction reaction is 500 to 800ºF - temperatures below this range do not provide enough energy to promote the reaction and lead to unreacted ammonia (or "slip") in the gas stream. If the flue gas exceeds the upper temperature limit, the chemical reactions can produce additional NO_x and excessive temperatures can destroy the catalyst. Other major issues of concern when considering SCR are the particulate concentration of the gas stream (particulate can foul the catalyst) and the additional pressure drop imposed by the catalyst bed (which requires additional fan capacity).

When a catalyst is not used, the process is termed Selective Non-Catalytic Reduction (SNCR). SNCR is accomplished in a combustion gas temperature range of 1,600 to 2,100 ºF. Temperatures above and below this range cause the same effects as with SCR - ammonia slip at low temperatures and NO_x formation at high temperature. NO_x removal efficiency is typically lower, and either ammonia or urea (or a urea-based formulation) is used as the reagent.
The technical feasibility of SNCR depends on the availability of access to a zone that has a temperature within the previously stated working range over all normal operating conditions. Suitable retention time at the optimal temperature range is also necessary to allow the reducing reactions to take place. SNCR is infeasible for application at a specialty steel pickling operation and ATI's annealing furnaces due to the temperature requirements necessary for SNCR. At the Vandergrift facility, the exhaust temperatures of the pickling operations are typically 100 to 150 ºF; the exhaust temperature of the annealing furnaces are typically 800 to 900 ºF. Also, according to USEPA's Air Pollution Control Technology Fact Sheet (EPA-452/F-03-031), SNCR is typically applied to industrial processes with uncontrolled NOx loading of 200 to 400 ppm. ATI's annealing furnace NOx loading is typically 30 to 50 ppm, which is well below the threshold for SNCR application. Finally, based on a review of the RBLC, no instances of an SNCR being installed on a specialty steel pickling process or annealing furnace were identified.

Hydrogen Peroxide Injection

Hydrogen peroxide injection is a means of reducing NO_x emissions from a mixed acid (nitric/hydrofluoric) solution. During the pickling process, the nitric acid is converted to nitrous acid that is insoluble in the mixed acid solution and decomposes into mixed NO_x that escapes to the atmosphere. Injecting hydrogen peroxide into the acid bath oxidizes the dissolved NO_x back to nitric acid before it escapes out of the solution. The rate of peroxide injection is controlled by the oxidation-reduction potential of the acid bath. Although the operating cost is high due to hydrogen peroxide consumption, the process would affect NO_x reduction in deep-bath pickling.

Absorption with Chemical Reaction

Absorption with chemical reaction is a NO_x reduction technique potentially applicable to the pickling line. It is a multi-stage, wet chemical mass transfer reduction process, designed to reduce NO_2 to molecular nitrogen and water. The reduction process is carried out in a packed column which is fed from a recirculation tank having chemical concentrations held to specific levels based on pH and reduction potential requirements.

Cost Effective Analysis for Source 120A – No. 90 A&P Line Annealing Furnace (50.5 MMBtu/hr)

Control Technology	Tech. Feasible	NOx Emissions before Control (tons/yr)	NOx Emissions after Control (tons/yr)	Total emission Reduction (tons/yr)	NOx ($/Ton) Removal Cost
LNB	Yes(Currently installed)	-	26	-	-

SCR + LNB	Yes(Currently installed)	26	5	21	70,257
LNB + FGR	Yes (LNB installed)	26	13	13	25,120
SCR	Yes(Currently installed)	-	-	-	
SNCR	No				

Cost Effective Analysis for Source 120D - 90 A&P Line - Mixed Acid Pickling

Control Technology	**Tech. Feasible**	**NOx Emissions before Control (tons/yr)**	**NOx Emissions after Control (tons/yr)**	**Total emission Reduction (tons/yr)**	**NOx ($/Ton) Removal Cost**
SCR	Yes[1]	103	21	82	20,075
Hydrogen Peroxide Injection	Yes[2]	103	26	77	18,946
Absorption (Wet Scrubber) plus Chemical Reaction	Yes[3]	currently installed	103	-	-
SNCR	No				
Absorption	Yes[4]				

Notes:
1. SCR- Temperature too low to apply this technology, auxiliary burner required.
2. 90L does not use "deep tank" design, therefore emission reduction may be lower than estimated; however, hydrogen peroxide injection is included in cost analysis.
3. Currently installed and operating. Absorption plus Chemical Reaction (90 Line Mixed Acid Pickling baseline emission rate for NOx = 103 TPY. This is existing Title V limit, which is based on absorption plus chemical reaction control technology.)
4. This technology is not applicable for cost analysis - current technology (which includes chemical reaction) provides better NOx reduction. technology is not applicable for cost analysis - current technology (which includes chemical reaction) provides better NOx reduction.

Cost Effective Analysis for Source 121E - 91 A&P Line - Mixed Acid Pickling

Control Technology	**Tech. Feasible**	**NOx Emissions before Control (tons/yr)**	**NOx Emissions after Control (tons/yr)**	**Total emission Reduction (tons/yr)**	**NOx ($/Ton) Removal Cost**
SCR	Yes[1]	57.4	11.5	46	34,991
Hydrogen Peroxide Injection	Yes[2]	57.4	14.4	43	30,589
SNCR	No				

Absorption (Wet Scrubber) plus Chemical Reaction	Yes[3]	57.4	currently installed	-	-
Absorption	Yes[4]				

Notes:

1. SCR- Temperature too low to apply this technology, auxiliary burner required.

2. 90L does not use "deep tank" design, therefore emission reduction may be lower than estimated; however, hydrogen peroxide injection is included in cost analysis.

3. Currently installed and operating._Absorption plus Chemical Reaction (91 Line Mixed Acid Pickling baseline emission rate for NOx = 57.4 TPY. This is existing Title V limit, which is based on absorption plus chemical reaction control technology.)

4. This technology is not applicable - current technology (which includes chemical reaction) provides better NOx reduction.

RACT DETERMINATIONS

In accordance with 25 PA Code 129.14(i)(1)(i), and as a result of the RACT 2 case-by-case analyses described above, existing equipment configurations, operating practices and control systems at the Vandergrift facility meet the requirements of RACT 3. Although technologically feasible control enhancements were identified during top-down analyses of the sources, none of the control options could be installed and operated for less than $7,500 per ton NO_x reduced, the PADEP threshold for requiring additional analysis under RACT 3.

Based on the results of the top-down analyses, it was concluded that No. 90 A&P Line Annealing Furnace, No. 91 A&P Line Annealing Furnace, No. 90 A&P Line Mixed Acid Pickling, and No. 91 A&P Line Mixed Acid Pickling processes satisfy RACT requirements under present operating conditions.

ATI is not proposing to add any specific new control equipment to demonstrate RACT. The RACT for NOx is to continue with good engineering practices to limit NOx formation in accordance with the case-by-case determinization. Compliance with the limitations in existence will be demonstrated through periodic source testing as part of the current permit conditions.

Department's Independent Analysis

Based on the Department's continuous review of permit applications since the applicability date of RACT II which have proposed various control methods, along with Department permitting staff participating in recent technical presentations by several vendors and manufacturers of pollution control technology, the Department concludes that there are no new or updated control technologies available that are applicable to controlling the nature of the sources and pollutants found at the ATI Vandergrift facility.

Also, the cost analysis for NOx control during RACT II evaluation resulted in a cost of greater than 7,500 dollars per ton.

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 equals RACT III umbrella.

Conclusion

The Department has analyzed the applicant's proposal for considering RACT II requirements as equal to RACT III and also performed independent analysis. Based on the information provided by the applicant 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.