Wabtec
CORPORATION

December 29, 2022

Mr. Eric Gustafson
Program Manager
Air Quality Program
Pennsylvania Department of Environmental Protection
230 Chestnut Street
Meadville, PA 16335-3481

RE: RACT III Analysis
Wabtec US Rail Inc. – Grove City Engine Plant
Grove City, PA
Title V Permit 43-00196

Dear Mr. Gustafson:

Please find enclosed the analysis as required by 25 Pa. Code 129.111-115 *et seq.*, *Additional RACT Requirements for Major Sources of NOx and VOCs for the 2015 Ozone NAAQS* (RACT III). This RACT III analysis identifies each individual NOx and VOC source and addresses the RACT III compliance status of each source.

Wabtec determined that all sources that were either exempt or have a presumptive RACT from the 2016 RACT II effort comply with a current exemption or with the RACT III presumptive RACT requirements. Furthermore, five sources that underwent a case-by-case RACT II analysis were determined to meet RACT III via the current RACT II restrictions, as no new technologies are readily available to review, and the cost effectiveness of existing technologies exceeds what is prescribed in RACT III. One source that underwent a case-by-case RACT II analysis is now applicable to a subsequently issued VOC RACT rule (25 Pa. Code 129.63a) and complies with that regulation.

Wabtec added several operations to the facility since the RACT II applicability date. These sources comply with RACT III through an exemption via RACT III presumptive RACT restriction or underwent a case-by-case RACT analysis. One source underwent a first-time case-by-case RACT review as part of the RACT III analysis. This source (Test Cell 6, Source ID 132F) is equipped with Best Available Technology for NOx and VOC as per the PA DEP Plan Approval process and was constructed after the RACT II and before the RACT III applicability dates. As such, additional level of emissions control is not technically feasible. Another source, Additive Manufacturing, complies with a Presumptive RACT.

The enclosed RACT III analysis – including the case-by-case RACT analysis – demonstrates Wabtec's compliance with the requirements of RACT III by the prescribed January 1, 2023, deadline.

If you have any questions regarding this submittal, please feel free to contact me at your convenience.

Sincerely,

Zambia Logero
EHS Manager

Enclosures

I hereby certify that, based on information and belief formed after reasonable inquiry, the statements and information herein (including any attachments), are true, accurate and complete.

Responsible Official Signature
John Singleton, Exec Shop Operations

12/29/22
Date

Reasonably Available Control Technology Analysis for Compliance with 25 Pa. Code 129.111-129.115 *Additional RACT Requirements for Major Sources of NOx and VOC for the 2015 Ozone NAAQS*

Submitted by:
Wabtec US Rail – Grove City Engine Plant
1503 W Main Street Ext.
Grove City, PA

December 29, 2022

REASONABLY AVAILABLE CONTROL TECHNOLOGY ANALYSIS

Wabtec US Rail, Inc. – Grove City Engine Plant
Grove City, PA

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REASONABLY AVAILABLE CONTROL TECHNOLOGY ANALYSIS

Wabtec US Rail – Grove City Engine Plant
Grove City, PA

1.0 RACT REQUIREMENTS AND APPLICABILITY

Wabtec US Rail (Wabtec) is submitting this NOx and VOC RACT analysis to comply with 25 Pa. Code §129. 111-129.115 *Additional RACT Requirements for Major Sources of NOx and VOC for the 2015 Ozone NAAQS (*referred to as RACT III), which states that the facility must submit information identifying the sources for which the RACT limitation or standard is being proposed; a demonstration that shows the proposed RACT limitation or standard satisfies the requirements for RACT; and a proposal for demonstrating compliance with the RACT limitation or standard (case-by-case RACT).

RACT is defined by the US EPA as the lowest emission limit which a particular source is capable of meeting by the application of control technology that is *reasonably available* considering technological and economic feasibility. RACT may require technology which has been applied to similar, but not necessarily identical, source categories, but is also characterized as demonstrated in practice.

2.0 RACT REVIEW

2.1. Initial RACT Review

As per the RACT requirements outlined in 25 Pa Code 129.111-129.115, Wabtec has performed an initial RACT review to determine if any sources currently meet available presumptive RACT and/or are exempt from the RACT review. This analysis is presented in Table 1. This analysis includes the results of the RACT II from 2016 and Wabtec is referencing that case-by-case analysis as the basis for this analysis and will not present the detailed findings only a summary as the findings still applies.

Based on the analysis presented in Table 1, Test Cells 1-6 require a case-by-case RACT analysis. Each of the other sources at the Grove City Engine Plant is either exempt from RACT or currently meets a Presumptive RACT requirement as outlined within RACT II or RACT III rules. The remainder of this report focuses on the case-by-case RACT analysis for these sources.

2.2. Case-by-Case RACT Review Methodology

The case-by-case requirements are outlined in 25 Pa. Code 129.114(i)(1) *Alternative RACT proposal and petition for alternative compliance schedule* and summarized as the following procedures:

a) Ranking of available control options by control effectiveness;
b) Evaluation of technical feasibility of the available control options;
c) Ranking the technically feasible options; and

d) Evaluation of the cost effectiveness of the technically feasible options.
This step requires both the net cost effectiveness of a single technology and the incremental cost effectiveness between the more effective and next most effective control technology.

Depending on the technical and cost effectiveness determinations developed using the above procedures, Wabtec will identify RACT.

3.0 AVAILABLE CONTROL TECHNOLOGIES

Pursuant to the RACT requirements, Wabtec evaluated control technologies to determine an emission limit which a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility. Wabtec then evaluated whether the technologies and RACT limitation or standard satisfy the requirements for RACT. Information for the RACT III analysis was obtained from two primary sources: 1) RACT /BACT (Best Available Control Technology) /LAER (Lowest Achievable Emission Rate) Clearinghouse (RBLC) database and 2) Practical and Engineering Experience. The RACT II analysis included a literary search on U.S. Environmental Protection Agency (EPA) published data, but that did not identify any additional technologies that were not already described in the RBLC or on-site experience with BAT installed on three of the test cells.

For the RACT II analysis performed in 2016, Wabtec conducted a full top-down analysis consistent with EPA guidance, starting with identifying reasonably available technologies to reduce NOx and VOC for test cells. Wabtec references that approved submittal for the basis of this review. Reasonably available is considered any technology in place and active. Hence, it did not consider novel or technologies under development as those would not be considered reasonably available.

3.1. RBLC Database Search

The EPA RACT/BACT/LEAR Clearinghouse database (RBLC) was reviewed for industry experience with implementing a VOC and/or NOx RACT limitations on Test Cells. As shown in Table 2, the RBLC database search for VOC and/or NOx RACT implementations resulted in several facilities with VOC and/or NOx determinations for BACT, LAER and case-by-case (RBLC did not identify applicable regulation). No implementations were identified for RACT.

Based on information in the RBLC database thermal oxidizers and catalytic oxidizers were identified on one test cell each as BACT or case-by-case for VOC, respectively. Good combustion or operating practices were identified on multiple test cells for both pollutants; one result focused on limiting non-essential run time as a method of limiting emissions. No feasible controls were identified as BACT or case-by-case for NOx and VOC on eleven units. One set of test cells had a LAER determination that requires the purchase

of 206 tons per year of offsets (required for Non-attainment New Source Review); however, no other technologies were identified to control NOx and/or VOC.

Based on the review of the RBLC, only one new entry was identified since the RACT II effort, and that source has been added to the RBLC results presented in Table 2. This entry does not identify any new technology.

3.2. Existing Sources Onsite

One test cell at Wabtec is equipped with controls for NOx and VOC (as an associated emissions reduction for carbon monoxide) and uses dry diesel particulate control combined with a catalytic oxidizer followed by Selective Catalytic Reduction (SCR). As mentioned in the RACT II case-by-case analysis diesel particulate removal is necessary to ensure that catalyst fouling in the SCR does not occur. The dry particulate filter and the catalytic oxidizer are built together and are placed in front of the SCR to ensure that the SCR catalyst bed is protected. This unit, while not applicable to RACT II, was the basis for the RACT II Analysis.

3.3. Literature Search

The US EPA has produced a library of documents to aid in identifying acceptable control technologies for reducing ozone-causing emissions. The Control Techniques Guidelines (CTGs) are used to presumptively define RACT while Alternative Control Techniques (ACTs) describe available control technologies and their respective cost effectiveness. As part of the RACT II analysis, these documents were evaluated for potential control devices, and it was determined that no technologies were identified that have been applied to a combustion device similar to an engine test cell. The RACT III analysis reviewed the EPA data and determined that no new ACTs or CTGs have been issued that may identify a new technology for the reduction of VOC and/or NOx from Test Cells.

3.4. Summary of Technologies to be Evaluated

The following presents the technologies that were evaluated for technical feasibility in order of potential control level. The control reduction percentages correspond with the values typically achieved in practice for the control technology. The applied control reduction percentage will be determined as part of the technical feasibility analysis.

NOx Reduction
Selective Catalytic Reduction – 70%-90%
Selective Non-catalytic Reduction – 30%-50%
Good Combustion Practices - NA

VOC Reduction
Thermal Oxidation – 95%-98%
Catalytic Oxidation – 90%-95%
Adsorption – 75%-95%
Absorption – 90%-95%
Good Combustion Practices - NA

4.0 NOx TECHNOLOGY REVIEW

4.1. Review of RACT II Evaluations as Applied to RACT III

The case-by-case RACT II submitted to PA DEP in 2016 included a detailed analysis of SCR, SNCR and Good Combustion Practices and still applies to the applicable sources as no new technologies for the reduction of NOx from test cells are readily available. Selective Catalytic Reduction (SCR) is determined to be the only NOx reduction technology that is technically feasible for the test cells that do not already have BAT installed. Consequently, a detailed cost analysis for retrofitting SCR onto the existing test cells are included discussed in Section 6.

4.2. Review of RACT III For Test Cell 6 Source 132F

Test Cell 6, Source ID 132F, is equipped with Best Available Technology for NOx as per the PA DEP Plan Approval process and was constructed after the RACT II and before the RACT III applicability dates. Since BAT was installed, it is not technically feasible to further reduce emissions from this source.

5.0 VOC TECHNOLOGY EVALUATION

5.1. Review of RACT II Evaluations as Applied to RACT III

The case-by-case RACT II submitted to PA DEP in 2016 still applies to the facility as no new technologies for the reduction of VOC from test cells are readily available. The RACT II includes a detailed analysis of thermal oxidation, catalytic oxidation, adsorption, absorption, and Good Combustion Practices. Based on the VOC RACT II analysis for the Test Cells, no add-on technology is technically feasible for the reduction of VOC for systems that do not already have catalytic oxidation for the control of carbon monoxide. Wabtec's RACT II analysis is still valid for sources 132A through 132E.

5.2. Review of RACT III For Test Cell 6 Source 132F

Test Cell 6, Source ID 132F, is equipped with Best Available Technology for VOC as per the PA DEP Plan Approval process and was constructed after the RACT II and before the RACT III applicability dates. Since BAT was installed, it is not technically feasible to further reduce emissions from this source.

6.0 ECONOMIC IMPACTS

6.1. Cost Parameters

Installation of SCR for NOx control on existing uncontrolled test cells is the only control technology determined to be technically feasible. Guidelines provided in the *OAQPS Cost Manual* (EPA 452/B-02-001) are the basis for the cost calculations. Wabtec provided capital costs, support personnel costs, and utility costs that are used in the calculations.

The existing uncontrolled test cells at the Grove City Engine Plant are grouped together in the current permit (Source ID No. 132) with total emissions of NOx limited to 450.25 tons per year per the most recent Title V permit. To ensure a conservative calculation (i.e., resulting in the lowest cost effectiveness value), Wabtec assumed that all of the emissions could be emitted through a single test cell.

6.2. Additional Information to Cost Analysis

To adjust the costs for 2022, Wabtec evaluated the Consumer Price Index to adjust the capital costs. According to the CPI, from 2016 to 2022 costs for goods increased 8 percent. (see support data for analysis). Consequently, Capital Cost items were increased by 8% from the 2016 values. Furthermore, labor, and other direct costs were confirmed, and adjustments made as necessary.

6.3. Economic Feasibility

PA DEP has determined that a cost-effective reduction in emissions for RACT would be established at $7,500 per ton for NOx as per §129.114(i)(1). Based on the economic analyses for NOx as presented in Table 3, the following is a summary of the analysis

- NOx: SCR: $8,529-47,203 per ton

Wabtec has concluded that no NOx technology is economically feasible for application in the currently uncontrolled test cells in Source 132 would meet the requirement for RACT.

7.0 CASE-BY-CASE RACT ANALYSIS RECOMMENDATION

Based on the results of the above RACT analysis presented in Table 4, Wabtec proposes that the existing RACT II requirements for the applicable sources remain as RACT. For the RACT III applicable test cell that did not undergo a RACT II analysis, Test Cell 132F, Wabtec proposes RACT be the following: Test Cell 6 (132F) and the control device shall be installed, maintained, and operated in accordance with manufacturer's specifications and good operating practices.

Table 1 - RACT Assessment for Existing Sources

Source ID #	Source Name	Description[1]	Actual Emissions (tpy from 2021 AIMS Report) NOx	VOC	RACT II Compliance Option (exempt, presumptive RACT or case-by-case RACT)	RACT III Compliance Option (exempt, presumptive RACT or case-by-case RACT)	Schedule for Compliance	Permit Reference
Case-by-case RACT								
132A	Diesel Engine Test Cell 1	253.9 gal/hr Diesel	127.39	6.24	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Case-by-case RACT	Current Operation Complies with RACT II	Section E, Groups 03 and 04
132B	Diesel Engine Test Cell 2	253.9 gal/hr Diesel			The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Case-by-case RACT	Current Operation Complies with RACT II	Section E, Groups 03 and 04
132C	Diesel Engine Test Cell 3	253.9 gal/hr Diesel			The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Case-by-case RACT	Current Operation Complies with RACT II	Section E, Groups 03 and 04
132D	Diesel Engine Test Cell 4	307 gal/hr Diesel			The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Case-by-case RACT	Current Operation Complies with RACT II	Section E, Groups 03 and 04
132E	Diesel Engine Test Cell 5	380 gal/hr Diesel	1.71	0.04	Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Case-by-case RACT	Current Operation Complies with RACT II	Section E, Group 04
132F	Diesel Engine Test Cell 6	380 gal/hr Diesel full engine test cell with air pollution controls consisting of a DPF with associated CATOX and SCR.	0.32	0.006	RACT not applicable as per 129.96(a): construction of emission source commenced after 7/20/2012.	Case-by-case RACT		
Presumptive RACT								
031	Boiler - 400 HP	13.4 mmBtu/hr Natural Gas	0.51	0.028	Presumptive RACT in 129.97(c)(3) - A boiler or other combustion source with individual rated gross heat input of less than 20 million BTU/hr must operate in accordance with manufacturer specifications and good operating procedures.	Presumptive RACT in 129.112(c)(4) - A boiler or other combustion source with individual rated gross heat input of less than 20 million BTU/hr must operate in accordance with manufacturer specifications and good operating procedures.	Already in compliance	Section E, Group 01, #006 requires source to be operated in accordance with manufacturer specifications and good engineering procedures.
037	Boiler - 800 HP	26.8 mmBtu/hr Natural Gas	0.55	0.030	Presumptive RACT in 129.97(b)(1) - A boiler or other combustion source with individual rated gross heat input equal to or greater than 20 million BTU/hr but less than 50 mmBtu/hr must conduct a biennial tune-up.	Presumptive RACT in 129.112(b)(1)(i) - A boiler or other combustion source with individual rated gross heat input equal to or greater than 20 million BTU/hr but less than 50 mmBtu/hr must conduct a biennial tune-up.	Already in compliance	Section E, Group 01, #004 requires source to be operated in accordance with manufacturer specifications and good engineering procedures.
039	Misc NG Sources	100 mmBtu/hr Natural Gas	1.59	0.087	Presumptive RACT in 129.97(c)(3) - A boiler or other combustion source with individual rated gross heat input of less than 20 million BTU/hr must operate in accordance with manufacturer specifications and good operating procedures.	Presumptive RACT in 129.112(c)(4) - A boiler or other combustion source with individual rated gross heat input of less than 20 million BTU/hr must operate in accordance with manufacturer specifications and good operating procedures.	Already in compliance	Section D #004 requires source to be operated in accordance with manufacturer specifications and good engineering procedures.

Table 1 - RACT Assessment for Existing Sources

Source ID #	Source Name	Description[1]	Actual Emissions (tpy from 2021 AIMS Report) NOx	VOC	RACT II Compliance Option (exempt, presumptive RACT or case-by-case RACT)	RACT III Compliance Option (exempt, presumptive RACT or case-by-case RACT)	Schedule for Compliance	Permit Reference
Presumptive RACT (Continued)								
137	Emergency Generators (2), 125 HP & 250 HP	3,375 ft³/hr Natural Gas Emergency generators operating less than 500 hours per year	Reported as part of Source 039[2]	Reported as part of Source 039[2]	Presumptive RACT in 129.97(c)(8) requires that units must operate in accordance with manufacturer specifications and good operating procedures.	Presumptive RACT in 129.112(c)(10) requires that units must operate in accordance with manufacturer specifications and good operating procedures.	Already in compliance	Section E, Group 07, #005 outline the requirements to operate according to manufacturer specifications and good engineering procedures.
138	Emergency Diesel Fire Pump, 185 HP	12 gal/hr No. 2 Fuel Oil	0.042	0.022	Presumptive RACT in 129.97(c)(8) requires that units must operate in accordance with manufacturer specifications and good operating procedures.	Presumptive RACT in 129.112(c)(10) requires that units must operate in accordance with manufacturer specifications and good operating procedures.	Already in compliance	Section E, Group 07, #005 outline the requirements to operate according to manufacturer specifications and good engineering procedures.
144	Additive Manufacturing	1 Gal per hour Binder	NA	NA	RACT not applicable as per 129.96(a): construction of emission source commenced after 7/20/2012.	Presumptive RACT in 129.112(c)(2) - VOC source with PTE less than 2.7 tpy maintained and operated in accordance with the manufacturer's specifications and with good operating practices.	Already in compliance	Section D, #001 outline the requirements to operate according to manufacturer specifications and good engineering procedures.
199	Other Miscellaneous Sources	Miscellaneous fugitive VOC emissions ocurring throughout the plant from use of VOC containing products outside of any established sources.	[3]	2.48	Presumptive RACT in 129.97(c)(2) - VOC source with PTE less than 2.7 tpy. Emissions calculated for AIMS reporting show no individual work station has VOC emissions greater than 2.7 tpy.	Presumptive RACT in 129.112(c)(2) - VOC source with PTE less than 2.7 tpy maintained and operated in accordance with the manufacturer's specifications and with good operating practices. Emissions in AIMS show no individual work station has VOC emissions greater than 2.7 tpy.	Already in compliance	Not Applicable
RACT Not Applicable								
140	Cleaning Operations	4 lbs/hr Cleaning Solvents	NA	NA	Case-by-case RACT	RACT III not applicable as per 129.111(a): site complies with 129.63a	Not Applicable	Section C, #019 outlines 129.63a requirements
106	Engine Paint Booth	36 Gal/hr Paint	NA	NA	RACT not applicable as per 129.96(a): site complies with 129.52.	RACT III not applicable as per 129.111(a): site complies with 129.52d	Not Applicable	Section E, Group 02 outlines 129.52d requirements
106B	Engine Cleaning Station	1.0 lbs/hr Aqueous Solution	NA	NA	RACT not applicable as per 129.96(c): VOC emissions are less than 1 tpy	RACT III not applicable as per 129.111(c): less than 1 tpy VOC	Not Applicable	Section D, #001 limits operation such that emissions are less than 1 pty VOC.
114	Component Paint Booth	1.0 Gal/hr Paint	NA	NA	RACT not applicable as per 129.96(a): site complies with 129.52.	RACT III not applicable as per 129.111(a): site complies with 129.52d	Not Applicable	Section E, Group 02 outlines 129.52d requirements
142	Adhesive Application Activities	1 lbs/hr Adhesive	NA	NA	RACT not applicable as per 129.96(a): site complies with 129.77.	RACT III not applicable as per 129.111(a): site complies with 129.577	Not Applicable	Section D, #001 outlines 129.77 requirements
143	Additive Manufacturing Emergency Generator	249 HP Natural Gas Emergency generators operating less than 500 hours per year	NA	NA	RACT not applicable as per 129.96(a): construction of emission source commenced after 7/20/2012.	RACT III not applicable as per 129.111(a): construction of emission source commenced after 8/8/2018	Not Applicable	

NOTES:

[1] Capacities listed in descriptions are generally taken from the current Title V permit and are for descriptive purposes only and not considered or intended to be limits.

[2] Not called out as a separate permitted source at the time the 2021 AIMS report was submitted. Emissions were reported under Source 039.

[3] Not called out as a separate permitted source at the time the 2021 AIMS report was submitted. Emissions were reported under Source 199.

Table 2

Summary of RBLC Findings

RBLC ID	Company & Facility Name	NAICS code	Process	Pollutant	Emission Rate	Units	Basis	Pollution Prevention/ Add-on Control Equip
TX-0925	Solar Turbines Dallas Overhaul Center	333611	Turbine Repair and Overhaul Facility	NOx	NA	NA	LAER	Good combustion practices, pipeline-quality NG and ULSD
IN-0195	Subaru of Indiana Automotive	33611	Gasoline Engine Testing & Start Up and Roll Testing	VOC	NA	NA	BACT-PSD	Observe good work practices: minimize excessive testing outside of testing specifications.
PA-0282 (d)	Johnson Matthey - Catalytic Systems Div	336399	Engine Test Cells	NOx	11.0	tons/yr	Other	None indicated.
AL-0243	Hyundai Motor	336111	Engine Dynoamometer Test Stand	NOx	2.07 12.5	lbs/hr ppm@19%O2	BACT-PSD	None indicated, based on three engines and an afterburner
IL-0065	General Electric - Electromotive Division	336510	Durability Test Cells	NOx	1556	tons/yr	BACT-PSD	Pollution Prevention - turbocharging and aftercooling, or comparable.
IA-0076	John Deere	333111	Test Cells (53)	NOx	1.52 0.86	lbs/mmBtu lbs/hr	lbs/mmBtu lbs/hr	Good combustion practices
MI-0360	Daimler Chrysler Corporation	336312	Dynamometer Test Cells, controlled	NO2	0.105	lbs/gal	BACT-PSD	Thermal Oxidizers to reduce VOC
				VOC	0.006	lbs/gal		
			Dynamometer Test Cells, uncontrolled	NO2	0.20	lbs/gal	BACT-PSD	None indicated.
				VOC	0.16	lbs/gal		
PA-0154	General Electric Transportiaton, Grove City	333911	Test Cells 1 through 5	NOx	492.2	tons/yr	LAER	Engine retard, spilt cooling, electronic fuel injection, depending on engine. 206 tons of NOx offsets purchased. Limits based on 224,5000 gallons.
MI-0367	General Motors	unlisted	Engine Test Cells / Dynometer	NOx	1.38 2.20	lbs/mmBtu gasoline lbs/mmBtu diesel	BACT-PSD	None indicated.
MI-0306	Schenck Pegasus Corp	334514	Engine Test Cells, Dynomometers	NOx	5.76 25.2	lbs/hr tons/yr	Case-by-case	None indicated.
				VOC	0.62 2.72	lbs/hr tons/yr	Case-by-case	Catalytic Converter.
VA-0303	Stihl Inc.	333991	Engine Test Cells	NOx	4.7	tons/yr	SIP	Good combustion practices
				VOC	90.1	tons/yr	SIP	Good combustion practices
TX-0512	Caleb Brett Usa	336312	Gasoline Engine Testing	NOx	3.30 14.3	lbs/hr tons/yr	BACT-PSD	None indicated
				VOC	4.7 20.5	lbs/hr tons/yr	BACT-PSD	None indicated.
			Diesel Engine Testing MCD Stands	NOx	11.3 49.3	lbs/hr tons/yr	BACT-PSD	None indicated.
				VOC	0.8 3.4	lbs/hr tons/yr	BACT-PSD	None indicated.
			Diesel Engine Testing Cat Stands	NOx	12.2 53.8	lbs/hr tons/yr	BACT-PSD	None indicated.
				VOC	0.9 3.8	lbs/hr tons/yr	BACT-PSD	None indicated.
			Turbine Testing	NOx	1.2 5.3	lbs/hr tons/yr	BACT-PSD	None indicated.
				VOC	0.1 0.3	lbs/hr tons/yr	BACT-PSD	None indicated.

TABLE 3

NOx RACT COST ANALYSIS FOR SCR

Cost Parameter \ Source	Cells 1, 2, 3 each	Cell 4	Cell 5
ANNUALIZED CAPITAL COST DETERMINATION			
Direct Costs			
Purchased Equipment Costs (EC) (a)	$1,301,046	$1,814,400	$1,814,400
New Stack	$387,216	$540,000	$540,000
Upgraded Urea System	$38,880	$38,880	$38,880
Instrumentation (0.10 EC) (b)	$130,105	$181,440	$181,440
Freight (0.05EC) (b)	$65,052	$90,720	$90,720
Subtotal (PEC)	$1,922,299	$2,665,440	$2,665,440
Installation Costs (0.56EC) (b)	$967,199	$1,340,237	$1,340,237
Indirect Costs			
Engineering and Home Office (0.1PEC) (b)	$192,230	$266,544	$266,544
Process Contingency (0.05 PEC) (b)	$96,115	$133,272	$133,272
General Facilities (0.05 PEC) (b)	$96,115	$133,272	$133,272
Contractor Fees (0.1PEC) (b)	$192,230	$266,544	$266,544
Startup (0.01PEC) (b)	$19,223	$26,654	$26,654
Performance Test (0.01PEC) (b)	$19,223	$26,654	$26,654
Contengencies (0.15PEC) (b)	$288,345	$399,816	$399,816
Total Capital Costs (TCC)	**$3,792,978**	**$5,258,434**	**$5,258,434**
Annualized Capital Expenditures			
Capital Recovery Factor (7% over ten years) (b)	0.1424	0.1424	0.1424
Total Annualized Capital Costs (TACC)	**$540,120**	**$748,801**	**$748,801**
ANNUAL COSTS DETERMINATION			
Direct Annual Costs			
Administrative (0.02TCC) (b)	$75,860	$105,169	$105,169
Property Taxes (0.01TCC) (b)	$37,930	$52,584	$52,584
Insurance (0.01TCC) (b)	$37,930	$52,584	$52,584
Utilities			
Electricity (143kW@$0.07/kWh) (c) (d)	$87,688	$87,688	$87,688
Reactant (urea) ($3.75/gal@32%wt) (d)	$2,118,834	$2,118,834	$173,650
Downtime ($700/hr @144 hrs) (d)	$100,800	$100,800	$100,800
Operating Labor			
Operator (1/2 hr/shift) ($20.00/hr) (c)	$10,950	$10,950	$10,950
Supervision (0.15*operator labor) (b)	$1,643	$1,643	$1,643
Maintenance Labor			
Technician (1/2 hr/shift) ($36/hr) (c)	$19,710	$19,710	$19,710
Material (1.0 Main. Labor) (b)	$19,710	$19,710	$19,710
Indirect Annual Costs			
Overhead (0.60 O & M Labor) (b)	$19,382	$19,382	$19,382
Total Annual Costs (TAC)	**$2,530,435**	**$2,589,053**	**$643,869**
COST EFFECTIVENESS DETERMINATION			
Annual Emissions (ton)	450.00	450.00	36.88
Removal Efficiency	80%	80%	80%
NOx Removed (ton)	360.00	360.00	29.50
Total Annual Cost (TAC+TACC)	**$3,070,555**	**$3,337,854**	**$1,392,670**
Cost Effectiveness ($/ton NOx removed)	**$8,529**	**$9,272**	**$47,203**

(a) Based on GE Transportation Cell 132F Plan Approval
(b) Based on OAQPS Cost Control Manual, January 2002
(c) Estimate value
(d) Provided by Wabtec

Table 4 - RACT III Proposed Case-by-Case Assessment

Source ID #	Source Name	Description	RACT II Case-by-case Assessment	RACT III Case-by-case Requirements	RACT III Compliance Status
132A	Diesel Engine Test Cell 1	253.9 gal/hr Diesel	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Current operations comply with RACT III with existing monthly tracking.
132B	Diesel Engine Test Cell 2	253.9 gal/hr Diesel	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Current operations comply with RACT III with existing monthly tracking.
132C	Diesel Engine Test Cell 3	253.9 gal/hr Diesel	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Current operations comply with RACT III with existing monthly tracking.
132D	Diesel Engine Test Cell 4	307 gal/hr Diesel	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	The NOx emissions shall be restricted to 450.25 tpy based on a 12 consecutive month rolling total for Diesel Engine Test Cells 1 - 4 and shall not exceed 422.15 lb/hr based on a 30-consecutive calendar day rolling average for Diesel Engine Test Cells 1 – 4 combined. Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Current operations comply with RACT III with existing monthly tracking.
132E	Diesel Engine Test Cell 5	380 gal/hr Diesel	Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Calculation of NOx and VOC emissions, and fuel consumption on a 12 consecutive month rolling period	Current operations comply with RACT III with existing monthly tracking.
132F	Diesel Engine Test Cell 6	380 gal/hr Diesel; air pollution controls consisting of a DPF with associated CATOX and SCR.	RACT not applicable as per 129.96(a): construction of emission source commenced after 7/20/2012.	Test Cell 6 (132F) and the control device shall be installed, maintained, and operated in accordance with manufacturer's specifications and good operating practices.	Current operations comply with RACT III with existing permit requirements.

SUPPORT DATA

U.S. BUREAU OF LABOR STATISTICS

Databases, Tables & Calculators by Subject

Change Output Options: From: 2016 To: 2022 GO

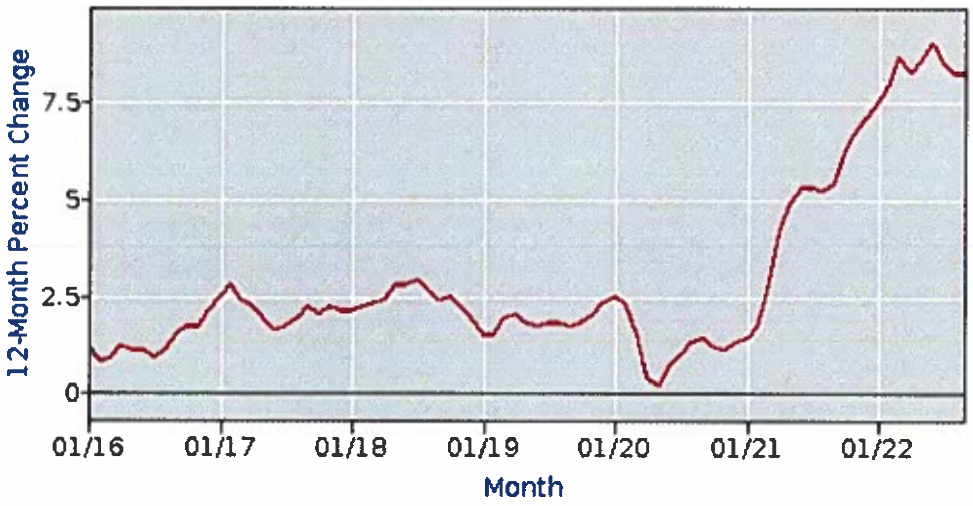
include graphs include annual averages

More Formatting Options

Data extracted on: October 20, 2022 (8:38:03 AM)

CPI for All Urban Consumers (CPI-U)

12-Month Percent Change
Series Id: CUSR0000SA0
Seasonally Adjusted
Series Title: All items in U.S. city average, all urban consumers, seasonally adjusted
Area: U.S. city average
Item: All items
Base Period: 1982-84=100



Download: xlsx

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	HALF1	HALF2
2016	1.2	0.8	0.9	1.2	1.1	1.1	0.9	1.1	1.5	1.7	1.7	2.1			
2017	2.5	2.8	2.4	2.2	1.9	1.6	1.7	1.9	2.2	2.0	2.2	2.1			
2018	2.1	2.2	2.3	2.4	2.8	2.8	2.9	2.7	2.4	2.5	2.2	1.9			
2019	1.5	1.5	1.9	2.0	1.8	1.7	1.8	1.8	1.7	1.8	2.0	2.3			
2020	2.5	2.3	1.5	0.4	0.2	0.7	1.0	1.3	1.4	1.2	1.1	1.3			
2021	1.4	1.7	2.7	4.2	4.9	5.3	5.3	5.2	5.4	6.2	6.8	7.1			

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NOTE: Draft determinations are marked with a " * " beside the RBLC ID.
Required fields are denoted by "+".

Report Date: 11/04/2022 Control Technology Determinations (Freeform)

Facility Information: SOLAR TURBINES DALLAS OVERHAUL CENTER

RBLC ID:	TX-0925
+Corporate/Company Name:	SOLAR TURBINES INCORPORATED
+Facility Name:	SOLAR TURBINES DALLAS OVERHAUL CENTER
Facility County:	DALLAS
Facility State:	TX
Facility ZIP Code:	
Facility Country:	USA
Facility Contact Name:	ADAM NAMMARI
Facility Contact Phone:	972-228-5535
Facility Contact Email:	
EPA Region:	6
Agency Code:	TX001
Agency Name:	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ)
Agency Contact:	MS. ANNE INMAN
Agency Phone:	(512) 239-1267
Agency Email:	anne.inman@tceq.texas.gov
Other Agency Contact Info:	Huy Pham Huy.Pham@tceq.texas.gov
+Permit Number:	20041, PSDTX1590, N196M1
+SIC Code:	3511
NAICS Code:	333611
Facility Registry System Number:	110000842642
Application Accepted Received Date:	06/14/2021 ACT
Permit Issuance Date:	08/31/2021 ACT
Date determination entered in RBLC:	06/29/2021
Date determination last updated:	12/01/2021
Permit Type:	B: Add new process to existing facility
Permit URL:	
Facility Description:	build and operate a new Test Cell No. 7 (EPN TC7) to support the production, development, and overhaul testing of new Titan 350 turbines
Permit Notes:	

Affected Boundaries: SOLAR TURBINES DALLAS OVERHAUL CENTER

+Boundary (Class 1 Area or US Border Name):	Caney Creek
Boundary Type (Class 1 or Intl Border):	CLASS1
Distance:	> 250 km
Class 1 Area State:	AR

Facility-wide Emissions: SOLAR TURBINES DALLAS OVERHAUL CENTER

+Pollutant Name:	None
Facility-wide Emissions Increase:	

Process Information: SOLAR TURBINES DALLAS OVERHAUL CENTER

+Process Name:	TURBINE TEST CELL
+Process Type:	11.310
Primary Fuel:	NATURAL GAS
Throughput:	0
Throughput Unit:	
Process Notes:	

Pollutant Information: SOLAR TURBINES DALLAS OVERHAUL CENTER - TURBINE TEST CELL

+Pollutant Name	Nitrogen Oxides (NOx)
Pollutant Group(s):	(InOrganic Compounds , Oxides of Nitrogen (NOx) , Particulate Matter (PM))
+CAS Number:	10102
Test Method:	Unspecified
+Control Method Code:	P
+Control Method Description:	good combustion controls regarding the operation of the turbines satisfy LAER and BACT for NOx emissions. Pipeline-quality natural gas and ultra-low sulfur diesel will be used.
Emission Limit 1:	0
Emission Limit 1 Unit:	
Emission Limit 1 Avg. Time/Condition:	
Emission Limit 2:	0
Emission Limit 2 Unit:	
Emission Limit 2 Avg. Time/Condition:	
Standard Emission Limit:	0

Standard Emission Limit Unit:	
Standard Limit Avg. Time/Condition:	
+Case-by-Case Basis:	LAER
Other Applicable Requirements:	
Did factors, other then air pollution technology considerations influence the BACT decisions?:	N
+Percent Efficiency:	
Compliance Verified:	Unknown
Cost Effectiveness:	
Incremental Cost Effectiveness:	
Cost Verified (Y/N)?:	No
Dollar Year Used In Cost Estimates:	
Pollutants/Compliance Notes:	

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