

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING DIVISION</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 4	PAGE 1
	APPL. NO. 528165,166	DATE 1/11/2012
	PROCESSED BY LI CHEN	CHECKED BY

PERMIT TO CONSTRUCT

COMPANY NAME AND ADDRESS

Pasadena City, DWP
72 E. Glenarm Street
Pasadena, CA 91105
SCAQMD ID # 800168

Contact: Gurchuran Bawa, (626) 744-6562

EQUIPMENT LOCATION

Glenarm Power Plant
72 E. Glenarm Street
Pasadena, CA 91105

EQUIPMENT DESCRIPTION

Section H of the facility permit ID #800168: Facility Description and Equipment Specific Conditions.

Equipment	ID No.	Connected To	RECLAIM Type/ Monitoring Unit	Emissions and Requirements	Conditions
PROCESS 2: INTERNAL COMBUSTION					
SYSTEM 1: TURBINES					
GAS TURBINE, GT-1, NATURAL GAS, CURTISS WRIGHT, MODEL MOD POD-30, WITH STEAM OR WATER INJECTION, 298 MMBTU/HR WITH : <u>PRATT WHITNEY FT4C</u>	D9	C50	NOx: MAJOR SOURCE	NOx: 9.0 PPMV NATURAL GAS (1) [RULE 2009]; NOx: 283.341 LBS/MMSCF NATURAL GAS (1) [RULE 2012]; NOx: 162 PPMV (8) [40CFR 60 SUBPART GG]; CO: 2,000 PPMV (5)	A63-2, A99-7, A195-7, A327-1, C1-8, C19-1, D12-4, D29-5, D82-3, D372-1

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Equipment	ID No.	Connected To	RECLAIM Type/ Monitoring Unit	Emissions and Requirements	Conditions
<u>POWER TURBINE</u> GENERATOR, 30.58 MW MAXIMUM LOAD, 22.5 MW BASE LOAD A/N: 438039 <u>528165</u>				[RULE 407]; PM: 11 LB/HR (5) [RULE 475]; PM: 0.01 GRAINS/SCF (5); PM: 0.1 GRAINS/SCF (5) [RULE 409] SO ₂ : 150 PPMV (8) [40CFR 60 SUBPART GG];	E57-2, I331-1, K40-2

BACKGROUND

The city of Pasadena (Pasadena) operates the Glenarm Power Plant for electricity generation. The facility includes four gas turbine generators and a boiler generator. Gas turbine generator GT1 was damaged by a fire in 2010. The fire damaged the power turbine of the generator. The compressor, the combustion turbine, and the combustor section are not damaged by the fire. The city of Pasadena intends to replace the power turbine with an identical unit. However, the manufacturer Curtis Wright is no longer in the power generation business that identical replacement cannot be found. After an engineering study it is determined that a Pratt Whitney FT4C power turbine will match the current power turbine specifications and performance.

The following is a list of the applications Pasadena has submitted. The applications were received on September 30, 2011. They were deemed complete on November 15, 2011.

Application Number	Purpose	Fee
528165	GT1 Power Turbine Replacement	\$4,636.58
528166	Title V minor revision	\$1,747.19

Pasadena is a Title V facility. It participates in the RECLAIM NO_x program.

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DISCUSSIONS

A simple cycle gas turbine is typically comprised of the compressor, the combustor, and the turbine. Air pollutants emissions are generated from combustion of fuel in the combustor. A power turbine is an auxiliary unit connected to the gas turbine exhaust. Thus, the power turbine has limited impact to the gas turbine emissions. The power turbine may change the emission characteristics of the gas turbine if it creates additional back pressure.

The facility has stated and demonstrated with test data that the new power turbine will not alter the emission characteristics of the existing gas turbine. With the new power turbine the unit has a slightly less power output and a smaller heat rate. For example, at 60 F, the gas turbine with Curtis Wright power turbine generates 28.8 MW and has a heat rating of 13700 Btu/kW-hr while the gas turbine with the Pratt Whitney power turbine generates 27.8 MW and has a heat rating of 13150 Btu/kW-hr. The data suggest that the heat input is 394.56 MMBtu/hr for the existing unit and 365.57 MMBtu/hr for the replacement unit. With the lower heat input and the anticipated same emission limits the replacement power turbine is not expected to have emission increases.

Therefore, the replacement of the power turbine is expected not to trigger NSR reviews.

RULE EVALUATIONS

California Environmental Quality Act (CEQA)

The applicant has indicated in the CEQA form that the proposed project will not trigger CEQA review.

Rule 212 – Standards for Approving Permits

The proposed modification will not increase emissions. Public notice is not needed.

Rule 401 – Visible Emissions

Visible emissions are not expected from this type of equipment if it is operating properly.

Rule 402 – Nuisance

Nuisance complaints are not expected.

Rule 407 – Liquid and Gaseous Contaminants

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This rule limits CO emissions to 2,000 ppmv. The requirement for SOx emissions does not apply since the equipment was commissioned prior to July 1, 1982. Compliance with the CO limit is anticipated and is to be verified through source tests.

Rule 409 – Combustion Contaminants

This rule limits PM emissions to 0.1 grains/dscf. Compliance is expected. Refer to the evaluation in Rule 475 for determinations.

Rule 431.1 – Sulfur Contents of Gaseous Fuels

The gaseous fuel used in this facility is commercial grade commercial grade natural gas complies with the sulfur limit of 16 ppmv. Compliance is expected.

Rule 475 – Electric Power Generation Equipment

This rule limits PM emissions to either less than 11 lb/hour or less than 0.01 grains/scf. As shown in the Appendix A, the worse case (fuel oil) PM emissions are 3.57 lb/hr. Therefore, compliance with this rule is expected.

Regulation XIII – New Source Review

There will be no emission increases. This regulation is not triggered.

Rule 1401 – New Source Review of Toxic Air Contaminants

There will be no emission increases. This regulation is not triggered.

Rule 2005 – New Source Review for RECLAIM

There will be no NOx emission increases. This regulation is not triggered.

Regulation XXX – Title V Facility Permits

Pasadena is a federal Title V facility. The proposed modification to GT1 constitutes a minor facility permit change. A draft permit revision will be prepared for this project (under application number 528166). In accordance with Title V requirements, a copy of the draft permit revision will be provided to the facility prior to submitting to the EPA for their review. The final permit to operate will be issued at the conclusion of the EPA 45-day review period as specified in Rule 3005(c)(2)(B)(ii).

RECOMMENDATIONS

The proposed modification is expected to comply with all applicable regulations. It is recommended that the District approve the proposed change of conditions.