

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT <i>ENGINEERING & COMPLIANCE</i> APPLICATION PROCESSING AND CALCULATIONS	PAGES 10	PAGE NO. 1
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	PROCESSED BY M SAULIS	CHECKED BY 

ENGINEERING EVALUATION

COMPANY NAME AND ADDRESS

City of Pasadena, Water and Power Department

CONTACT(S): Wes Stengel, Associate Engineer, (626) 744-6273

EQUIPMENT LOCATION

AQMD ID 800168
72 E. Glenarm Street
Pasadena, CA 91105

EQUIPMENT DESCRIPTION

Section D of the facility permit: Permit to Operate

The changes to the applicable portions of Section D will be shown with a ~~strikethrough~~ for deletions and an underline for additions.

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
Process 2: INTERNAL COMBUSTION					
System 1: TURBINES					
GAS TURBINE, PEAKING UNIT, GT-2, FUEL OIL, NATURAL GAS, CURTISS WRIGHT, MODEL MOD POD-30, WITH STEAM OR WATER INJECTION, 298 MMBTU/HR WITH A/N 438040 <u>555813</u>	D10	C51	NOX: PROCESS UNIT <u>MAJOR SOURCE</u>	CO: 2000 PPMV (5) [RULE 407]; NOX: 9 PPMV NATURAL GAS (1) [RULE 2012]; NOX: 162 PPMV NATURAL GAS (8A) [40 CFR 60 SUBPART GG] PM: 11 LBS/HR (5A) [RULE 475]; PM: 0.01 GRAINS/SCF (5B) [RULE 475]; PM: 0.1 GRAINS/SCF (5) [RULE 409] SO2: 150 PPMV NATURAL GAS (8A) [40 CFR 60 SUBPART GG]	A63.2, A99.7, A195.7, A327.1, C1.5, C19.1, D12.4, D82.3, D372.1, E57.2, <u>E313.1, E315.1</u>
GENERATOR, 30.58 MW					

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Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
SELECTIVE CATALYTIC REDUCTION, NO.1, SERVING GT2, PEERLESS, WITH A CORMETECH CMHT-XPI CATALYST, WITH AMMONIA INJECTION, 706 CU. FT. A/N: 437718	C51	D10 C50 C54		NH3: 5 PPMV (4) [RULE 1303 – BACT]	A195.6, D12.6, D12.7, D12.8, D29.4, D232.1, E73.4, E179.1, E179.2
SELECTIVE CATALYTIC REDUCTION, NO.1, SERVING GT2, PEERLESS, WITH A HALDOR TOPSOE DNX-630 CATALYST, WITH AMMONIA INJECTION, 477 CU. FT. A/N: 437718	C54	C51		NH3: 5 PPMV (4) [RULE 1303 – BACT]	A195.6, D12.6, D12.7, D12.8, D29.4, D232.1, E73.4, E179.1, E179.2

BACKGROUND

The City of Pasadena, Water and Power Department (PDWP) submitted a change of condition application, as well as a TV/RECLAIM application to designate turbine GT-2 as a non-operational major source. Table 1 below summarizes the applications submitted for the facility.

Table 1 Application Summary

A/N	Equipment	Submittal Date	Deemed Complete	BCAT/ CCAT	Schedule	Fee
555812	TV/RECLAIM Revision	8/29/13	9/20/13	555009	-	\$1,824.90
555813	TURBINE ENGINE (<=50MW) EL PEAK OTH FUEL	8/29/13	9/20/13	012708	D	\$3,252.87

In October 2012, Unit GT-2 experienced a fire that resulted in the unit becoming inoperable. The event was well documented in the Inspector's reports and in the local media. PDWP had recently settled with the insurance company and will be pursuing a feasibility study to determine whether to replace or refurbish the damaged unit. They are anticipating that the process, including: the City of Pasadena's decision to repair or replace, acquisition of funds, selection of equipment vendors and contractors, construction, and finally having the unit operational will take a number of years to complete.

PDWP had submitted a Petition for Variance (Case No. 2244-30) on July 9, 2013 to provide relief from the annual NH3 source testing requirements up to December 31, 2017. The District recommended that PDWP file applications to designate the unit as non-operational in accordance with Rule 2012(c)(9) instead of requesting a variance for 4 and a half years, which would not have been granted. The regular variance was heard on August 27, 2013. Relief was provided for up to 120 days to account for the time it would take to file the applications, process them and forward the draft permit and analysis to EPA for review.

The application for the change of conditions is requesting the following:

- Designate turbine GT-2 as a non-operated major source in accordance with Rule 2012(c)(9). A condition will be placed on the permit for the equipment fuel line to be disconnected and flanged. Approved non-operational equipment is not required to operate the NOx CEMS for daily calibrations or for quarterly linearity tests and are not required to perform annual or semi-

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annual CEMS assessments while rendered non-operational. The equipment must meet the monitoring requirements of Rule 2012 within 30 calendar days of start-up.

- Remove source testing requirements for the equipment deemed as non-operated. In order to comply with the Rule 1303(a) BACT emission limits, the permit is conditioned for annual source testing for NH3 slip. The facility is requesting not to have to perform these source tests while the turbine is non-operational. The anniversary date to perform the NH3 slip test was on August 29, 2013. A condition will be placed on the permit to complete the required source test within 45 days of start-up.

In addition, some administrative changes will also be done on the permit that includes:

- Changing the RECLAIM source type of units GT-1 and GT-2, in Section D, from NOx Process Units to Major Sources. The units are Major Sources and have always been treated as Major Sources; however, the permit erroneously identifies the units as process units.
- Correct permit condition A63.2, in Condition D, to properly reference units GT-1 and GT-2, with the correct emission factors as intended in the engineering evaluation for application nos. 438039 & 438040.

The draft permit will be forwarded to EPA for the 45 day review as a part of the Title V minor permit revision.

COMPLIANCE REVIEW

A review of the District Compliance database reveals that the facility received two Notices to Comply (NC) and three Notices of Violation (NOV) within the last two year period. The Notices are summarized below:

- NC D20376 was issued on 6/29/11 to the facility to provide emission records, start-up and shutdown records, CEMS calibration dates and monthly emissions. The NC was closed on 7/6/11.
- NC D20377 was issued on 7/14/11 to report records and to submit Title V for 500-ACC on time and calculate total monthly emissions. The NC was closed on 8/11/11.
- NOV P37217 was issued on 6/22/11 for unit GT-4 exceeding the 6.0 ppmv CO emission concentration as listed on the permit. The NOV was closed on 5/29/12.
- NOV P51970 was issued on 3/15/11 for device D36 exceeding the permitted shutdown period. The NOV was closed on 5/29/12.
- NOV P55663 was issued on 8/7/12 to the facility for failing to report total quarterly emissions for process units D11 and D12.

As a RECLAIM and Title V facility, inspections are conducted at this site on an annual basis.

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EMISSION CALCULATIONS

There are no changes in emissions associated with the change in conditions.

RULES EVALUATION

RULE 212-STANDARDS FOR APPROVING PERMITS AND ISSUING PUBLIC NOTICES

Rule 212 requires that a person shall not build, erect, install, alter, or replace any equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce, or control the issuance of air contaminants without first obtaining written authorization for such construction from the Executive Officer. Rule 212(c) states that a project requires written notification if there is an emission increase for ANY criteria pollutant in excess of the daily maximums specified in Rule 212(g), if the equipment is located within 1,000 feet of the outer boundary of a school, or if the MICR is equal to or greater than one in a million (1×10^6) during a lifetime (70 years) for facilities with more than one permitted unit, source under Regulation XX, or equipment under Regulation XXX, unless the applicant demonstrates to the satisfaction of the Executive Officer that the total facility-wide maximum individual cancer risk is below ten in a million (10×10^6) using the risk assessment procedures and toxic air contaminants specified under Rule 1402; or, ten in a million (10×10^6) during a lifetime (70 years) for facilities with a single permitted unit, source under Regulation XX, or equipment under Regulation XXX. There are no changes in emissions in emissions associated with the change in conditions; therefore, a public notice for Rule 212 is not required.

RULE 401 - VISIBLE EMISSIONS

This rule limits visible emissions to an opacity of less than 20 percent (Ringlemann No.1), as published by the United States Bureau of Mines. It is unlikely, with the use of the SCR /CO catalyst configuration on natural gas turbines that there will be visible emissions. However, in the unlikely event that visible emissions do occur, anything greater than 20 percent opacity is not expected to last for greater than 3 minutes. During normal operation, no visible emissions are expected. Therefore, based on the above and on experience with other natural gas fired turbines, compliance with this rule is expected. In addition, non-operation will mean no emissions at all.

RULE 402 - NUISANCE

This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause injury or damage to business or property. The turbine is not expected to create a public nuisance based on experience with identical natural gas fired turbines. A review of the District Compliance database indicates that no nuisance complaints have been received in regards to this facility. No nuisance is expected for non-operational equipment.

RULE 407 - LIQUID AND GASEOUS AIR CONTAMINANTS

This rule limits CO emissions to 2,000 ppmvd and SO₂ emissions to 500 ppmvd, averaged over 15 minutes. For SO₂, equipment which complies with Rule 431.1 is exempt from the SO₂ limit in Rule 407. The applicant will be required to comply with Rule 431.1 and thus the SO₂ limit in Rule 407 will not apply.

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RULE 409 – COMBUSTION CONTAMINANTS

This rule restricts the discharge of contaminants from the combustion of fuel to 0.1 grain per cubic foot of gas, calculated to 12% CO₂, averaged over 15 minutes. Continued compliance with this rule is expected. In addition, there will be no emissions while the equipment will be non-operational.

RULE 431.1-SULFUR CONTENT OF GASEOUS FUELS

The turbines will use pipeline quality natural gas which will comply with the 16 ppm sulfur limit, calculated as H₂S, specified in this rule. Natural gas will be supplied by the Southern California Gas Company which has a H₂S content of less 0.25 gr/100scf, which is equivalent to a concentration of about 4 ppm. It is also much less than the 1 gr/100scf limit typical of pipeline quality natural gas. Continued compliance is expected. In addition, there will be no emissions while the equipment will be non-operational.

RULE 475-ELECTRIC POWER GENERATING EQUIPMENT

This rule applies to power generating equipment greater than 10 MW installed after May 7, 1976. Requirements are that the equipment meet a limit for combustion contaminants of 11 lbs/hr or 0.01 gr/scf. Continued compliance with this rule is expected. In addition, there will be no emissions while the equipment will be non-operational.

RULE 1134 – EMISSIONS OF OXIDES OF NITROGEN FROM GAS TURBINES

This rule applies to gas turbines, 0.3 MW and larger, installed on or before August 4, 1989. The unit is subject to the requirements of Regulation XX; therefore, this Rule 1134 is not applicable.

RULE 1135 – EMISSIONS OF OXIDES OF NITROGEN FROM ELECTRIC POWER GENERATING SYSTEMS

This rule applies to the electric power generating systems of several of the major utility companies in the basin. The plants which are included in the RECLAIM program are no longer subject to the requirements of this rule. Therefore, the NO_x requirements of this rule are not applicable to the turbine.

40CFR PART 60 SUBPART GG – STANDARDS OF PERFORMANCE FOR STATIONARY GAS TURBINES

The turbine is rated at 298 MMBtu/hr; therefore, it is subject to the requirements of this subpart. The applicable requirements for non-operational status is §60.334(c) which states "... if the owner or operator submitted and received EPA, State, or local permitting authority approval of a procedure for monitoring compliance with the applicable NO_x emission limit under §60.332, that approved procedure may continue to be used". As the local permitting authority, AQMD evaluated the facility's CEMS certification report and RATA reports and determined that the equipment complied with Rule 2012. Since the equipment will comply with Rule 2012(c)(9) – non-operational status, continued compliance with this subpart is expected.

REGULATION XX – REGIONAL CLEAN AIR INCENTIVES MARKET (RECLAIM)

The facility is in NO_x RECLAIM and in cycle 1.

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RULE 2012 – REQUIREMENTS FOR MONITORING, REPORTING, AND RECORDKEEPING FOR OXIDES OF NITROGEN (NO_x) EMISSIONS

The turbine is a NO_x Major Sources under RECLAIM and is required to have CEMS under Rule 2012. The requirements to install, maintain, and operate a NO_x CEMS are not applicable if the unit is classified as a non-operated major source as outlined in Rule 2012(c)(9). The facility submitted applications for change of conditions to categorize the equipment as “non-operational”. The equipment has not previously been classified as a non-operated major source within the last 18 months. The facility has opted to comply by disconnecting the fuel feed lines and placing flanges at both ends of the disconnected lines and by rendering the equipment non-operational. Removal of a major component is required to verify non-operation; however, it has been confirmed by District enforcement staff that the equipment has been destroyed in the fire and incapable of resuming operation. Therefore, verification of inoperability by enforcement demonstrates compliance with the removal of major components requirement. The facility will be required to notify the District in writing no later than 30 days from the start of operation. In the event that any turbine is operated, the facility must perform RATA within 14 operating days from the start of operation.

REGULATION XXX – TITLE V

The facility is a major source for NO_x and has Title V permit. Their request to designate unit GT-2 as “non-operational” is considered a “minor revision”.

RULE 3003 - APPLICATIONS

The “minor permit revision” is expected to comply with all applicable requirements of this rule.

(i)(4) The minor revision will be issued only after the permit revision application has been found to comply with all conditions of this rule.

(j) EPA review will be required for the minor revision.

RULE 3005 – PERMIT REVISIONS

(c) The proposed minor permit revision satisfies all the applicable conditions listed in this rule. The modification constitutes an “minor permit revision” as defined in Rule 3000(b)(12).

RULE 3006 – PUBLIC PARTICIPATION

(b) The proposed “minor permit revision” is exempt from public participation.

PERMIT CONDITIONS

Only the changes to the permit are shown below. Deletions will be shown with an *italicized strikethrough* and additions will be shown with **bold underline**.

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CONDITION D

A63.2 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
CO	Less than 12,900 6,450 lbs in any 1 month
PM10	Less than 3,060 1,530 lbs in any 1 month
ROG	Less than 900 450 lbs in any 1 month
SOx	Less than 1,080 540 lbs in any 1 month

For the purposes of this condition, the limit(s) shall be based on the ~~total combined~~ emissions from ~~the a single~~ gas turbine ~~GT3 (D36) and the gas turbine GT4 (D42)~~.

The operator shall calculate the emission limit(s) during normal operations by using monthly fuel usage data and the following emission factors: CO: ~~31.33~~ **31.5** lb/MMscf, PM10: ~~7.37~~ **7.35** lbs/MMscf, ROG: ~~1.51~~ **2.2** lbs/MMscf, SOx: ~~0.31~~ **2.57** lbs/MMscf.

[Rule 1303 – Offsets]

[Devices subject to this condition: D9, D10]

E313.1 This device is classified as a non-operated major NOx source as defined under Rule 2012 and shall not be operated unless the facility permit holder provides written notification to the Executive Officer 30 days prior to starting operation. In order to maintain the non-operational status, the Facility Permit holder shall:

- (a) **Remove a section of fuel feed line(s) to the device and place a blind flange on both ends of the fuel feed line(s); and**
- (b) **Remove a major component of the source necessary for its operation.**

Removal of parts or components solely to qualify the device for non-operated classification pursuant to this condition, or replacement of the same parts or components resulting in the device no longer being classified as non-operated shall be not be deemed to affect the potential to emit within the meanings of Rule 2005, Regulation XIII, and Regulation XXX.

This device shall not be operated unless the Facility Permit Holder submits a complete application for change of condition to remove this condition from the facility permit 30 days prior to starting operation.

[RULE 2012]

[Devices subject to this condition: D10]

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E315.1 Once this device is operated, it shall no longer be classified as non-operational. This device shall also meet the monitoring requirements of Rule 2012, subparagraph (c)(2)(A) or (c)(2)(B) no later than 30 calendar days after the start of operation except as provided in Rule 2012, paragraph (c)(10).

[RULE 2012]

[Devices subject to this condition: D10]

D12.6 The operator shall install and maintain a(n) flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia (NH₃).

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

For control equipment serving turbines designated as non-operational major sources, calibrations and maintenance shall not be required during the period of time the turbine is non-operational.

For the purposes of this condition, non-operation shall be defined as zero fuel flow to the turbine verified by the removal of a section of fuel feed line(s) and the placement of a blind flange at each end of the fuel feed line(s). Maintenance, recordings and calibrations shall commence on the day the turbine first fires fuel.

[Rule 1303(a)(1) – BACT]

[Devices subject to this condition: C50, C51, C53, C54]

D12.7 The operator shall install and maintain a(n) temperature gauge to accurately indicate the temperature of the exhaust at the inlet to the SCR reactor.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

For control equipment serving turbines designated as non-operational major sources, calibrations and maintenance shall not be required during the period of time the turbine is non-operational.

For the purposes of this condition, non-operation shall be defined as zero fuel flow to the turbine verified by the removal of a section of fuel feed line(s) and the placement of a blind flange at each end of the fuel feed line(s). Maintenance, recordings and calibrations shall commence on the day the turbine first fires fuel.

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[Rule 1303(a)(1) – BACT]

[Devices subject to this condition: C50, C51, C53, C54]

D12.8 The operator shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches water column.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within plus or minus 5 percent. It shall be calibrated once every twelve months.

For control equipment serving turbines designated as non-operational major sources, calibrations and maintenance shall not be required during the period of time the turbine is non-operational.

For the purposes of this condition, non-operation shall be defined as zero fuel flow to the turbine verified by the removal of a section of fuel feed line(s) and the placement of a blind flange at each end of the fuel feed line(s). Maintenance, recordings and calibrations shall commence on the day the turbine first fires fuel.

[Rule 1303(a)(1) – BACT]

[Devices subject to this condition: C50, C51, C53, C54]

D29.4 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Avg. Time	Test Location
NH3	District Method 207.1 and 5.3 or EPA Method 17	1 hour	SCR Outlet

The test shall be conducted and the results submitted to the District within 60 days after the test date. The AQMD shall be notified of the date and time of the test at least 10 days prior to the test.

The test shall be conducted once per calendar quarter during the first twelve months of operation and annually thereafter. The NOx concentration, as determined by the certified CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable or not yet certified, a test shall be conducted to determine the NOx emissions using District Method 100.1 measured over a 60-minute averaging time period.

The test shall be conducted to demonstrate compliance with the Rule 1303 concentration limit.

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The annual source test shall not be required during the period of time that the turbine, to which this control system is connected, is non-operational. For the purposes of this condition, non-operation shall be defined as zero fuel flow to the turbine verified by the removal of a section of fuel feed line(s) and the placement of a blind flange at each end of the fuel feed line(s). The source test shall be performed within 45 calendar days from the day the turbine first fires fuel.

[Rule 1303(a)(1) – BACT]

[Devices subject to this condition: C50, C51, C53, C54]

D82.3 The operator shall install and maintain a CEMS to measure the following measures:

NOx concentration in ppmv

The CEMS shall be installed and operating no later than one year after the initial start-up of the turbine and shall comply with the requirements of Rule 2012. During the interim period between the initial start-up and the provisional certification date of the CEMS, the operator shall comply with the monitoring requirements of Rule 2012(h)(2) and 2012(h)(3). Within two weeks of the turbine start-up date, the operator shall provide written notification to the District of the exact start-up date.

For turbines designated as non-operational major sources, The NOx CEMS shall be installed, maintained and operated in the accordance with the requirements of Rule 2012, including the requirements of Rule 2012 (c)(9) for sources qualifying as non-operated major NOx sources.

For the purposes of this condition, non-operation shall be defined as zero fuel flow to the turbine verified by the removal of a section of fuel feed line(s) and the placement of a blind flange at each end of the fuel feed line(s).

[Rule 2012]

[Devices subject to this condition: D9, D10]