ENGINEERING EVALUATION FOR 44.6 MW POWER PLANT

APPLICANT Southern California Edison (*AQMD ID 17104)*

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EQUIPMENT LOCATION 10601 Firestone Blvd
Norwalk, CA 90650

EQUIPMENT DESCRIPTION

Section D of the Facility Permit, ID# 17104

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
PROCESS 1: POWER GENERATION					
SYSTEM 4: EMERGENCY IC ENGINE					
INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, MODEL 3306 ATAAC, DIESEL FUEL, CATERPILLAR, SERIAL NO. 9NR03099, WITH AFTERCOOLER, TURBOCHARGER, 377 BHP A/N: 393143	D10			**NOX**: 6.9 G/BHPH (4) [RULE 1303-BACT] **CO**: 8.5 G/BHPH (4) [RULE 1303-BACT]; **VOC**: 1.0 G/BHPH (4) [RULE 1303-BACT]; **PM10**: 0.38 G/BHPH [RULE 1303-BACT]	C1.6, E193.4, K67.5,
GENERATOR, 250 kW	B12				
SYSTEM 5: RULE 219 EXEMPT EQUIPMENT SUBJECT TO SOURCE SPECIFIC RULES					
RULE 219 EXEMPT EQUIPMENT, COATING EQUIPMENT, PORTABLE, ARCHITECTURAL COATING	E16			VOC: (9) [Rule 1113, Rule 1171]	K67.4
RULE 219 EXEMPT EQUIPMENT, EXEMPT HAND WIPING OPERATIONS	E17			VOC: (9) [Rule 1171]	
RULE 219 EXEMPT EQUIPMENT REFRIGERATION UNITS	E18				H23.3

Section H of the Facility Permit, ID# 17104

Equipment	ID No.	Connected To	RECLAIM Source Type/ Monitoring Unit	Emissions and Requirements	Conditions
PROCESS 1: POWER GENERATION					
SYSTEM 1: GAS TURBINE					
GAS TURBINE, UNIT NO. 1, NATURAL GAS, GENERAL ELECTRIC MODEL LM6000PC SPRINT, SIMPLE CYCLE, HEAT INPUT REFERENCED AT 93 DEGREES FAHRENHEIT, WITH WATER INJECTION, 441.7 MMBTU/HR, WITH A/N: 462008 GENERATOR, 44.6 MW	D1 B2	C3		**CO**: 6 PPM NATURAL GAS (4) [RULE 1303(a)(1)-BACT]; **CO**: 2000 PPM (5) [RULE 407]; **NOX**: 2.5 PPM NATURAL GAS (4) [RULE 1303(a)(1)-BACT]; **NOX**:25 PPM NATURAL GAS (8) [40 CFR60 SUBPART KKKK]; **VOC**: 2 PPM NATURAL GAS (4) [RULE 1303(A)(1)-BACT]; **PM**: 0.1 GR/SCF (5) [RULE 409]; **PM**: 11 LBS/HR (5A) [RULE 475]; **PM**: 0.01 GR/SCF (5B) [RULE 475]; **SOX**: 0.060 LBS/MMBTU (8) [40CFR 60 SUBPART KKKK] **SO2**: (9) [40CFR 72 – ACID RAIN]	A63.1, A63.2, A63.3, A63.4, A99.1, A99.2, A195.1, A195.2, A195.3, A327.1, C1.1, C1.2, C1.3, D12.1, D29.1, D29.2, D29.3, D82.1, E193.3, H23.2, K40.1, K67.1
CO OXIDATION CATALYST, BASF, 80 CUBIC FEET OF TOTAL CATALYST VOLUME A/N: 462011	C3	D1 C4			
SELECTIVE CATALYTIC REDUCTION, CORMETECH CMHT-21, WITH 547 CUBIC FEET OF CATALYST VOLUME, HEIGHT: 25 FT 9 IN; WIDTH: 18 FT 0 IN; DEPTH: 2 FT 6 IN; WITH A/N: 462011 NH3 INJECTION GRID	C4 B5	C3 S6		**NH3**: 5 PPM (4) [RULE 1303(a)(1)-BACT]	A195.5, D12.2, D12.4, D12.6, E179.1, E179.2, E193.1
STACK, TURBINE NO. 1, DIAMETER: 13 FT, HEIGHT: 80 FT A/N: 462008	S6	C4			

SYSTEM 2: EMERGENCY IC ENGINE					
INTERNAL COMBUSTION ENGINE, EMERGENCY POWER, NATURAL GAS, WAUKESHA, MODEL VGF36 GL/GLD, 865 BHP A/N: 462010 GENERATOR, 645 kW	D7 B8			**NOX**: 107 PPM (4) [RULE 1303-BACT] **CO**: 224 PPM (4) [RULE 1303-BACT]; **VOC**: 111 PPM (4) [RULE 1303-BACT]	C1.4, D12.5, D29.4, E162.1, E193.3, K67.2,
SYSTEM 3: INORGANIC CHEMICAL STORAGE					
STORAGE TANK, TK-1, FIXED ROOF, 19 PERCENT AQUEOUS AMMONIA, 10,000 GALLONS A/N: 462006	D9				C157.1, E144.1

FEE SUMMARY

Southern California Edison ("SCE") submitted four applications for a new peaker power plant to be built at an existing substation located in Norwalk. SCE filed the applications with request to expedite per Rule 301(t). A fifth application was received later by AQMD for an initial Title V. Table 1 summarizes the cost breakdown for the filing fees required for this project.

TABLE 1

Project Filing Fees Overview						
A/N	**Submittal Date**	**Deemed Complete**	**Equipment**	**BCAT/ CCAT**	**Schedule**	**Fee**
462006	11/2/06	1/17/07	Ammonia storage tank	210900	A	$1,063.82 + $531.91 (XPP)
462008	11/2/06	1/17/07	Gas turbine, 44.6 MW	033008	D	$3,701.25 + $1,850.62 (XPP)
462010	11/2/06	1/17/07	Emergency ICE	043002	B	$1,695.47 + $847.74 (XPP)
462011	11/2/06	1/17/07	SCR	81	C	$2,681.75 + $1,340.87 (XPP)
463006	11/17/06	1/17/07	Initial Title V	555003	N/A	$1,108.36
Total						$14,821.79

FACILITY DESCRIPTION

The proposed power plant will be constructed at 10601 Firestone Boulevard on SCE substation property located in Norwalk, California. It will be bordered to the east and west by the existing substation. A horticultural nursery is located north of the proposed site and a gasoline station and a miniature golf recreational facility are located to the south. East of the substation property is the 605 freeway and residential housing. The proposed power plant will consist of a natural gas-fired combustion turbine generator ("CTG"), an air pollution control

("APC") system consisting of a selective catalytic reduction ("SCR") system and an oxidation catalyst, an aqueous ammonia storage tank, a natural gas-fired black start engine, water storage tanks, water demineralizer, as well as various on-site support equipment. The project's electrical interconnection to the grid will be made at the existing substation.

COMPLIANCE REVIEW

A review of the District database reveals that there is an emergency engine located on site. An inspection was conducted on 11/16/06 and it was determined that the facility was operating in compliance. No NOVs or NCs have been issued to this facility. A copy of the Facility Equipment List Report printed from the Compliance Tracking System database is shown in Appendix A.

PROJECT OVERVIEW

SCE is proposing to install an electric power generating peaker unit at an existing substation in Norwalk. The peaker unit will operate intermittently on a demand basis to provide voltage and frequency support to the local area. The proposed project is the result of an August 15, 2006 Assigned Commissioner's Ruling from the California Public Utilities Commission ("CPUC") directing SCE to have additional electric power available for the summer of 2007 operation. Please refer to the application package for additional information on the CPUC ruling. As a result, SCE filed applications for five (5) new peaker plants, of which four (4) are to be located within the jurisdiction of SCAQMD. This engineering evaluation analyzes the proposal for the Center substation project.

SCE submitted four applications for the equipment listed in Table 1, as well as an Initial Title V application as the facility is subject to the Acid Rain requirements of Title IV. SCE is requesting fuel usage restrictions (shown in Table 2) and an annual cap of less than 4 tons-NO_X per year to ensure the facility remains below offset thresholds.

SCE already has an existing emergency ICE on site, A/N 393143, with emissions that will be counted towards the total facility emissions. Therefore, the fuel usage restrictions initially proposed by SCE will be adjusted to ensure the facility remains below the Regulation XIII offset thresholds.

TABLE 2

Fuel Consumption Restrictions for GTG	
Parameter	Consumption Rate
Natural gas usage	4.63×10^6 scf/day
	5.43×10^8 scf/yr (commissioning year) [a]
	6.36×10^8 scf/yr (non-commissioning year) [a]

[a] SCE initially proposed 5.90×10^8 scf/yr, commissioning year, and 6.80×10^8, non-commissioning year, but never accounted for the existing emergency ICE; therefore, the fuel usage for the turbine will be further restricted.

The facility is proposing to operate the GTG for a total of 1,510 hours per non-commissioning year. The proposed operating schedule is shown in Table 3.

TABLE 3

Proposed Operating Schedule	
Event	Duration (hrs/yr)
Total Annual Hours	1,510 [a]
Normal Operations	1,270 [b]
Start-up	120
Shutdown	120
Commissioning	25

[a] Calculated as 636 MMscf/yr ÷ 0.421 MMscf/hr ≈ 1,510 hrs/yr

[b] Calculated as 1,510 hrs/yr – 120 hrs-start-ups/yr – 120 hrs-shutdowns/yr = 1,270 hrs/yr

PROCESS DESCRIPTION [1]

Combustion Turbine Generator ("GTG")

The GTG proposed is an LM6000 gas turbine which is essentially an aeroderivative turbine, meaning that it is a dual-rotor, "direct drive" gas turbine, derived from the CF6-80C2, high-bypass, turbofan aircraft engine. The LM6000 takes advantage of its parent aircraft engine's low-pressure rotor operating speed of approximately 3,600 rpm. The low-pressure rotor is the driven-equipment driver, providing for direct coupling of the gas turbine low-pressure system to the load (the electrical generator). The LM6000 gas turbine consists of a five-stage low-pressure compressor; a 14-stage high-pressure compressor, which includes six variable-geometry stages; an annular combustor with 30 individually replaceable fuel nozzles; a two-stage, air-cooled high-pressure turbine; and a five-stage low-pressure turbine, and the overall pressure ratio is approximately 29 to 1. The LM6000 gas turbine has two concentric rotor shafts: the low pressure (LP) compressor and turbine form the LP rotor, and the high pressure (HP) compressor and turbine from the HP rotor. The LM6000 is equipped with an evaporative cooling system that will be used for cooling the combustion air, and each unit will use the LP turbine to power the output shaft with a direct coupling to the 3600-rpm generator for 60 Hz power generation. The generator is a synchronous, two-pole cylindrical rotor generator with forced air-cooling. For purposes of performance, and to assist prospective buyers, the ISO has developed a set of conditions for rating and comparing gas turbine engines. ISO conditions are shown in Table 4.

[1] The process description of the LM6000 turbine and the discussions on the Brayton cycle and the SPRINT ™ technology is taken from Ken Coats' evaluation for a similar project for Wellhead Power Colton, LLC A/N 439100.

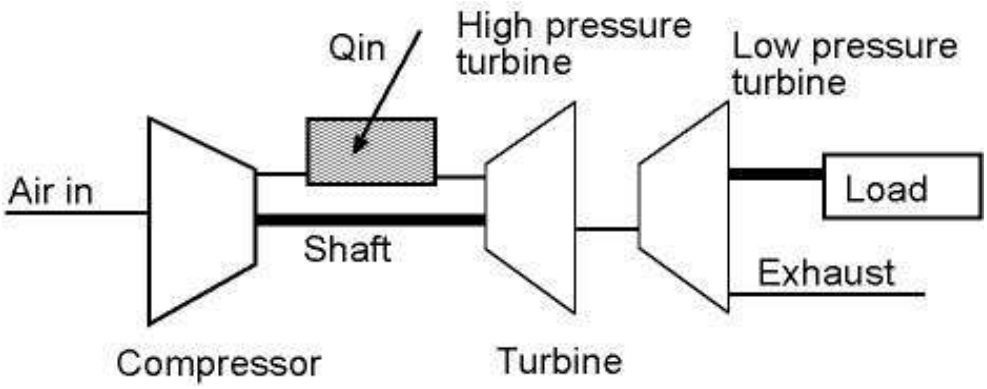
TABLE 4

ISO Conditions	
Parameter	
Ambient Temperature	15°C (59°F)
Barometric Pressure	14.70 psia (29.92 inches of Hg)
Relative Humidity	60%
Elevation	Sea level

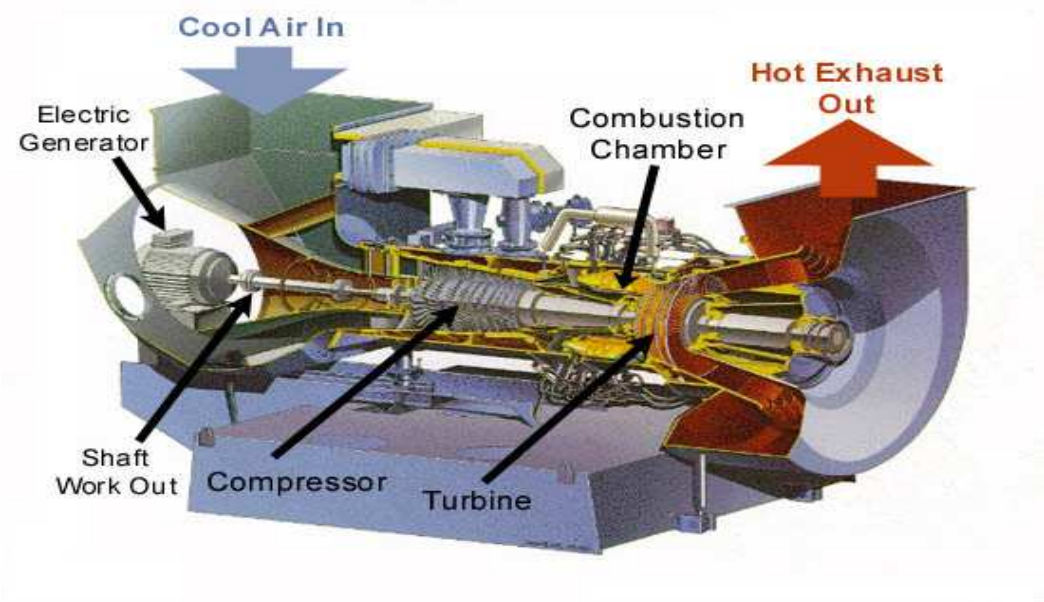
General Discussion of the Brayton Power Cycle

There are two power cycles that are generally used in the generation of electricity with turbines; the Rankine cycle (steam turbines), and the Brayton cycle (gas turbines). The Rankine cycle is used in most base load power plants which involve a combined cycle configuration as opposed to a simple cycle configuration. The Brayton cycle is the power cycle used for gas turbines, often used in peaking applications, such as this proposal. The Brayton cycle is an open cycle where ambient air is compressed to high temperature and pressure before it is fed to the combustion chamber. In the combustion chamber, the air-fuel mixture is ignited, dramatically increasing the temperature of the mixture. These hot gases are then expanded in a turbine, which can be coupled to an electric generator, as is the case with SCE. The LM6000 gas turbine operating on the Brayton Cycle configured with its dual concentric rotor shafts is shown in the generalized diagrams below[2].

Open Brayton Cycle with a Dual Rotor Shaft Arrangement



[2] Note that the specific diagram configuration for the gas turbine may vary slightly due to the use of the SPRINT™ Technology



The above discussion focuses on the basics of the GE LM6000 gas turbine. However, SCE is proposing to install a modified version of the LM6000. The gas turbine being installed at the Center substation is General Electric's LM6000PC SPRINT™ model, rated at a 44.6 MW. The LM6000PC SPRINT™ model is a more efficient engine due primarily to the incorporation of SPRINT™ technology. A discussion of the principles of SPRINT™ technology is provided below.

Discussion of SPRINT™ Technology

Unlike most gas turbines, the LM6000 is primarily controlled by the compressor discharge temperature in lieu of the turbine inlet temperature. Some of the compressor discharge air is then used to cool high-pressure turbine components. SPRINT™, which stands for "*spr*ay *int*ercooled" reduces compressor discharge temperature thereby allowing advancement of the throttle to significantly enhance power by 9 percent at ISO conditions and greater than 20 percent at 90°F (32°C) ambient temperatures. The LM6000 Sprint system is composed of atomized water injection at both low-pressure compressor (LPC) and high-pressure compressor (HPC) inlet plenums. This is accomplished by using a high-pressure compressor, eighth-stage bleed air to feed two air manifolds, water-injection manifolds and sets of spray nozzles, where the water droplets are sufficiently atomized before injection at both LPC and HPC inlet plenums. Benefits of LM6000 Sprint generator-set include a generation capacity of up to 44.6 MW, development of full power within 10 minutes of start-up, multiple uses (peaking power, base loading, cycling), dual fuel capacity (distillate or natural gas), easy on-site maintenance, higher efficiency (~40%) than their heavy duty Frame counterparts (~32-34%). In summary, SPRINT™ technology uses spray intercooling to boost the power output of the basic LM6000 gas turbine by significantly increasing the mass airflow through cooling of the air during the compression process. Typical results range from approximately 9% more power output at ISO conditions to approximately 20% more power output on days when the ambient temperature is around 90ºF. Therefore, as ambient temperature rises, the benefits of SPRINT technology become more significant. Table 5 lists the equipment specifications.

TABLE 5

LM6000PC SPRINT™ Specifications	
Specification	
Manufacturer	General Electric
Fuel Type	CA PUC quality natural gas
Average Fuel Heat Content	1,050 Btu/scf
Proposed Fuel Consumption	441.7 MMBTU/hr, HHV
Maximum Exhaust Flow	1,094,104 lb/hr
Water Injection Rate	50 gpm
Exhaust Temperature	829ºF
Power Output	44.6 MW
Uncontrolled NOx Emissions w/ H_2O Injection	25 ppmvd @ 15% O_2

Water will be injected into the combustors to control the NOx emissions to 25 ppmvd at 15% oxygen. The water used for injection will improve power performance and overall efficiency.

APC System

The gas turbine will be configured with an APC system to control the CO, NOx, and VOC emissions. To a lesser degree, the APC systems will also reduce emissions of formaldehyde (H_2CO) and acetaldehyde (CH_3CHO) from the gas turbine. The APC system will be configured with the following equipment: (1) aqueous ammonia storage and transfer equipment, (2) heated ammonia vaporization skid, (3) ammonia distribution header, (4) CO/oxidation catalyst, (5) SCR catalyst, and (6) 80' high x 13'-0" ID exhaust stack.

Aqueous Ammonia Storage Tank and Forwarding Pump Skid

The ammonia will be transported to the site in aqueous form which will have a maximum concentration of 19% by weight. The ammonia will be stored in a specially designated fixed roof horizontal tank with a capacity of 10,000 US gallons, a maximum design pressure of 50 psig internal and 2 psig external, and it will be constructed with galvanized steel to ASME Section VIII, Division 1 technical standards. A vapor return line will be used during receiving operations to control filling losses. A pump skid will be used to provide the required flow and pressure of aqueous ammonia to the SCR system through two carbon steel pumps.

Ammonia Evaporation Skid and Injection Grid

The ammonia evaporation skid will be used to vaporize the 19% aqueous ammonia so that it can be transferred to the ammonia injection grid. The ammonia injection equipment will be shop-assembled and skid mounted for easy field installation. During cold start-up of the turbine, it will take some time (~10 minutes) before the ammonia injection chamber is hot enough to heat the ammonia for injection. Therefore, the system is equipped with an electric heater which can be initiated prior to the cold start-ups to ensure that the ammonia is adequately heated. The ammonia evaporation skid will be configured with two dilution air fans and one-heater element and two atomizing nozzles. The aqueous ammonia is typically atomized in the ammonia injection chamber before

being delivered to the selective catalytic reduction system through the ammonia injection grid. The grid is used to deliver the hot ammonia and air mixture uniformly into the flue gas. The injection occurs downstream of the oxidation catalyst where the turbulence of the flue gas combined with even distribution helps to create a homogenous mixture before entry into the SCR catalyst.

CO/Oxidation Catalyst

A CO/oxidation catalyst will be used to control both CO and VOC emissions. The catalyst will also control the formaldehyde and acetaldehyde emissions. The catalyst is located within a structural catalyst frame integral to the housing, with room for additional layers of catalyst. The system is equipped with an alarm which will sound when the catalyst exceeds its maximum allowable operating temperature. Table 6 is a summary the CO/oxidation catalyst specifications.

TABLE 6

CO/Oxidation Catalyst Specifications	
Specification	
Manufacturer	BASF Catalysts, LLC (formerly Englehard)
Model	EIT PO 0676-07
Catalyst Type	Precious metal coating on a metallic substrate
Catalyst Dimensions	26'-8" H. X 18'-0" W. X 0'-7.5" D.
Space Velocity	205,000 hr^{-1}
Area Velocity	360 ft/hr
Minimum Operating Temperature	500°F
Maximum Operating Temperature	1,250°F
Max Outlet CO	6.0 ppmvd (1-hour average @ 15% O_2)
Max Outlet VOC	2.0 ppmvd (1-hour average @ 15% O_2)

SCR Catalyst

The SCR catalyst will be provided by Cormetech and will be located within a structural catalyst frame and downstream from the CO/oxidation catalyst. The normal operating temperature of the SCR catalyst is 870 °F and thermal degradation of the catalyst begins as temperatures exceed 875 °F. However, the catalyst can withstand temperatures up to 932 °F for less than 500 hours and up to 1,022 °F for less than 4 hours. The system is equipped with an alarm which will sound when the catalyst exceeds its maximum allowable operating temperature. In order to ensure the flue gas temperature does not exceed the upper temperature range of the SCR, a tempering air system will be installed that consists of two fans each equipped with isolation and control dampers. Instrumentation will be installed in the air duct to ensure proper operation of the fans and to provide feedback to the control system. The maximum airflow will be approximately 18,000 acfm and will vary depending on the elevation and ambient conditions. The minimum airflow will be approximately 10,720 acfm. Table 7 is a summary of the SCR system specifications.

TABLE 7

SCR System Specifications	
Specification	
Manufacturer	Cormetech
Model	CMHT-21
Catalyst Type	Vanadia-Titania homogenous
Catalyst Dimensions	25'-9" H. X 18'-0" W. X 2'-6" D.
Space Velocity	25,540 hr^{-1}
Area Velocity	15.3 Nm/hr
Minimum NH_3 Injection Temperature	540°F
Maximum Operating Temperature	870°F
Maximum NH_3 Slip	5.0 ppmvd (1-hour average @ 15% O_2)
Max Outlet NO_X	2.5 ppmvd (1-hour average @ 15% O_2)

Continuous Emissions Monitoring System (CEMS) and Data Acquisition and Handling System (DAHS)
The CEMS/DAHS will be custom made and provided by GE Management Services Inc. It will measure outlet NO_X, CO, O_2 and fuel consumption. The CEMS will use an extractive sampling system and will be housed in an 8' x 8' x 8' walk-in shelter that will include a wall mounted-mounted air conditioning unit, as well as the required stack probes and sampling lines. Training as well as certification testing by a RATA contractor will be provided by GE. SCE will be required to file a CEMS application with District Source Test Engineering to have the CEMS certified.

Performance Warranty for APC System
Performance warranties for both CO/oxidation and SCR catalysts have been submitted along with the application package and any pertinent operating conditions for which the warranties are valid are also included. The performance warranties are included in the application package. According to the performance warranty, GE guarantees the outlet emission rates shown in Table 8 below.

TABLE 8

Warranted Emission Rates for APC System	
Pollutant	Warranted Emissions
Outlet NOx emissions	2.5 ppmvd @ 15% O_2, 1-hour average
Outlet CO emissions	6.0 ppmvd @ 15% O_2, 1-hour average
Outlet VOC emissions	2.0 ppmvd @ 15% O_2, 1 hour average
Ammonia Slip	5.0 ppmvd @ 15% O_2, 1-hour average

CRITERIA POLLUTANTS EMISSIONS AND CALCULATIONS - GTG

START-UP & SHUTDOWN EMISSIONS

SCE has proposed 120 start-ups and 120 shutdowns per year for a total of 240 events per non-commissioning year, which leaves 1,270 hours per year of normal operations as shown in Table 3. SCE proposed 60 start-ups and 60 shut-downs for the commissioning year. A maximum of 1 start-up and 1 shutdown event will occur per day. Start-up is the period of time the GTG is heated from cold or ambient temperature to its operating temperature. Because the CO/oxidation and SCR catalysts have minimum operating temperature requirements (as shown in Tables 6 and 7), the emissions during start-up are uncontrolled and only begin to be controlled in phases. GE provided graphs that illustrate the estimated start and shutdown sequences for the GTG as well as emission profiles for NO_X, CO and VOC.

For the first two minutes after the initiation of the start sequence the starter cranks the turbine and it is purged. The turbine fires after approximately two minutes and the speed is gradually increased to sync idle in the absence of any load. During this time, the emissions are approximately 42 ppmvd- NO_X, 88 ppmvd-CO and 5 ppmvd-VOC, all at 15% O_2. After the sixth minute, the turbine accelerates to base load and the NO_X emissions begin to increase and spike at approximately 60 ppmvd @ 15% O_2 at which time water injection commences at 6 ½ minutes and the NO_X emissions begin to decrease to 25 ppmvd @ 15% O_2. During this time the CO emissions decrease to approximately 15 ppmvd and then gradually rise to 35 ppmvd, both at 15% O_2. The VOC emissions also decrease to less than 2 ppmvd @ 15% O_2. The turbine reaches base load in 10 minutes. At the tenth minute the turbine has reached operational temperature and the CO/oxidation and SCR catalysts are fully operational. A maximum of one hour will be allocated for start-up.

Shutdown is the period of time the GTG is allowed to cool from its normal temperature operating range to cold or ambient temperature. GE estimates the duration of the shutdown sequence to be 8 minutes. Ammonia injection will cease prior to the shutdown sequence. Upon commencement of shutdown, the turbine's load will be reduced from full load to no load in 3 minutes. Water injection will be stopped at approximately 10 MW. The NO_X concentrations will increase once ammonia injection is stopped and will increase further when water injection is discontinued. The CO concentrations will increase as the load and operating temperatures decrease. The GE graphs show no change in the VOC emission profile; however, it is likely the VOC emissions will also increase as the operating temperatures decrease. A maximum of one hour will be allocated for shutdown.

COMMISSIONING YEAR EMISSIONS

The commissioning year is the first year of operation of the GTG, APC and associated equipment. It consists of testing at various loads for the purposes of optimizing the equipment following the initial installation. The emissions are higher during this period as the GTG combustors may not be optimally tuned and the APC may not be operational. SCE is proposing 25 hours of commissioning that includes only partial or no control. SCE is projecting to install the equipment in the summer of 2007; therefore, because of a short commissioning year, they are proposing 60 start-ups and 60 shut-downs for a total of 120 events per commissioning year. GE also recommends 300 hours of base load operation prior to emissions testing for VOC and PM_{10} as a condition to their guarantee.

NON-COMMISSIONING YEAR EMISSIONS

The emissions from the gas turbine are affected by the ambient meteorological conditions, elevation, and modes of operation. GE provided a number of case numbers predicting the performance of the GTG at two different ambient temperatures, 93°F and 37°F, at 50 and 100% loads. Case number 110 was proposed at an ambient temperature of 37°F for NO_X, CO and VOC emissions in Table 9. During normal operations, with the exception of start-ups and shutdowns, the emissions will be controlled to BACT levels shown in Table 8. Normal operation is assumed to be at full load with a fuel consumption rate of 441.7 MMBtu/hr of natural gas and a water injection rate of 15,882 lb/hr. The APC will be in full operation.

DATA

- Proposed fuel consumption is 441.7 MMBtu/hr (Applicant)
- Fuel use is 0.421 MMscf/hr for normal ops., start-ups and shutdowns (Applicant)
- Daily natural gas fuel usage is 4.63×10^6 scf/day (Applicant)
- Commissioning year natural gas fuel usage is 5.43×10^8 scf/yr (Applicant)
- Non-commissioning year natural gas usage is 6.36×10^8 scf/yr (Applicant)
- Commissioning year start-ups/ shutdowns will be 60 for a total of 120 events per year (Applicant)
- Non-commissioning year start-ups/shutdowns will be 120 for a total of 240 events per year (Applicant)
- Maximum of 1 start-up and 1 shutdown per day
- Natural gas HHV is 1,050 Btu/scf (Regulation XX, Rule 2012, Table 3-D)
- SO_X emission factor is 0.0006 lb/MMBtu (based on natural gas sulfur content of 0.20 grains/100 scf)
- Uncontrolled NO_X concentration is 61 ppmvd @ 15% O_2 (Manufacturer's data)
- Uncontrolled CO concentration is 47 ppmvd @ 15% O_2 (Manufacturer's data)
- Uncontrolled VOC concentration is 7.28 ppmvd @ 15% O_2 (Manufacturer's data)
- NO_X water injection control only concentration is 25 ppmvd @ 15% O_2 (Manufacturer's data)
- 25 hours for commissioning; 5 hours uncontrolled and 20 hours water injection control only (Applicant)
- Operation schedule is 11 hrs/day (4.63 MMscf/day ÷ 0.421 MMscf/hr), 7 days/wk and 19 wks/yr (1,510 hrs/yr ÷ (4.69 MMscf/day ÷ 0.421 MMscf/hr) ÷ 7 days/week)

TABLE 9

GTG Emission Rates				
Pollutant	Emission Rate Normal Operation [a] (lb/hr)	Emission Rate Start-up [b] (lb/hr)	Emission Rate Shutdown [b] (lb/hr)	Source
NO_X	4.40	7.82	6.61	Manufacturer/Applicant
SO_X [c]	0.27	0.27	0.27	Applicant
PM_{10} [d]	4.53	4.53	4.53	Manufacturer/Applicant
CO	6.40	8.82	7.95	Manufacturer/Applicant
VOC	1.30	1.67 [e]	1.61 [f]	Manufacturer/Applicant
NH_3	3.20	3.20	3.20	Manufacturer

[a] Normal operation emissions are based on GE specifications case #110 for NO_X, CO and VOC.
[b] Start-up and shutdown emissions for NO_X, CO and VOC were calculated by consultant as [(uncontrolled) (lb/hr) x (duration in minutes uncontrolled)/60 + controlled (lb/hr) x (duration in minutes controlled)/60].
[c] SO_X emissions were calculated by consultant as 441.7 MMBtu/hr x 0.0006 MMBtu/hr ≈ 0.27 lb/hr and are assumed to be the same for start-ups and shutdowns.
[d] PM_{10} emissions are based on GE specifications case #110 of 4.00 lb/hr and assumption that sulfur component will react with ammonia to form ammonium sulfate. The value was calculated by consultant as 4.00 lb/hr + 2 x 0.27 lb/hr ≈ 4.53 lb/hr and assumed to be the same for start-ups and shutdowns.
[e] Original value of 1.58 lb/hr was calculated by consultant assuming a 33% VOC conversion efficiency from original GE specifications case #110; however, SCE submitted revised GE specification data for case #110 that shows an efficiency of 72.5%. Therefore, the revised VOC start-up emission value is calculated as [(1.30/(1-0.725) (lb/hr) x 6.5/60 + 1.30 x (5.5 + 48)/60] ≈ 1.67 lb/hr.
[f] Original shutdown emission rate of 1.54 lb/hr was also calculated assuming a 33% VOC conversion efficiency. Therefore, the revised VOC shutdown emission value is calculated as [(1.30/(1-0.725) (lb/hr) x 5.5/60 + 1.30 x (2.5 + 52)/60] ≈ 1.61 lb/hr.

TABLE 10

GTG Emission Data								
Pollutant	Uncontrolled Conc. (ppmvd)	Water Injection Control Conc. (ppmvd)	Controlled Conc. (ppmvd)	Uncontrolled Rate (lb/hr)	Water Injection Control Rate (lb/hr)	Controlled Rate (lb/hr)	Uncontrolled EF (lb/MMscf)	Controlled EF (lb/MMscf)
NO_X	61	25	2.5	107.36	44.00	4.40	255.21	10.46
SO_X				0.27	0.27	0.27	0.64	0.64
PM_{10}				4.53	4.53	4.53	10.77	10.77
CO	47	47	6.0	50.13	50.13	6.40	119.18	15.21
VOC	7.28	7.28	2.0	4.73	4.73	1.30	11.25	3.09
NH_3			5.0	3.20	3.20	3.20	7.61	7.61

TABLE 11

GTG Non-Commissioning Year Emissions

Pollutant	Uncontrolled Rate [a] (lb/day)	Controlled Rate [b] (lb/day)	30-Day Avg [c] (lb/day)	Annual Controlled Rate [d] (lb/yr)	Monthly Controlled Rate [e] (lb/mo)
NO_X	1,181.64	54.06	20	7,327.90	1,621.74
SO_X	2.97	2.97	1	408.21	89.15
PM_{10}	49.86	49.86	18	6,848.84	1,495.76
CO	551.78	74.41	27	10,152.47	2,232.32
VOC	52.08	14.99	6	2,047.05	449.65
NH_3	35.22	35.22	13	4,838.03	1,056.61

[a] Uncontrolled rate calculated as fuel consumption (MMscf/day) x uncontrolled EF (lb/MMscf).
[b] Uncontrolled rate calculated as fuel consumption (MMscf/day) x controlled EF (lb/MMscf).
[c] 30-day Avg calculated as controlled rate (lb/day) x 7 days/wk x 19 wks/yr ÷ (12 mo/yr x 30 days/mo).
[d] Annual controlled rate calculated as (start-up emissions (lb/hr) + shutdown emissions (lb/hr)) x 120 events/yr + controlled EF (lb/MMscf) x (636 MMscf/yr – 240 events/yr x 0.421 MMscf/hr).
[e] Monthly controlled rate calculated as controlled EF (lb/MMscf) x (4.63 MMscf/day – 2 x 0.421 MMscf/hr) x 30 + start-up emissions (lb/hr) x 30 + shutdown emissions (lb/hr) x 30.

TABLE 12

GTG Commissioning Year Emissions

Pollutant	Uncontrolled Emissions [a] (lb)	Water Injection Control Emissions [b] (lb)	Total Commissioning Emissions [c] (lbs)	Commissioning Fuel Consumed [d] (MMscf)	Fuel for Normal Operations [e] (MMscf)	Normal Operation Emissions [f] (lb)	Commissioning Year Rate [g] (lb/yr)	Commissioning Year Monthly [h] Rate (lb/mo)
NO_X	536.80	880.00	1,416.80	10.52	532.48	5,907.36	7,324.16	2,928.54
SO_X	1.35	5.40	6.75	10.52	532.48	341.77	348.52	89.15
PM_{10}	22.65	90.60	113.25	10.52	532.48	5,734.11	5,847.36	1,495.76
CO	250.67	1002.67	1,253.33	10.52	532.48	8,339.37	9,592.71	3,325.65
VOC	23.66	94.64	118.30	10.52	532.48	1,686.35	1,804.65	535.45
NH_3					532.48	4,050.59	4,050.59	976.61

[a] Uncontrolled emissions calculated as uncontrolled EF (lb/MMscf) x 5 hours.
[b] Water injection control emissions calculated as water injection control EF (lb/MMscf) x 20 hours.
[c] Total commissioning emissions calculated as uncontrolled emissions (lb) + water injection control emissions (lb).
[d] Commissioning fuel consumed calculated as 0.421 MMscf/hr x 25 hours = 10.52 MMscf.
[e] Fuel for normal operations calculated as 543 MMscf/yr – 10.52 lb/MMscf (commissioning fuel consumed) = 532.48 MMscf.
[f] Normal operations rate calculated as start-up emissions (lb/hr) x 60 events/yr + shutdown emissions (lb/hr) x 60 events/yr + (fuel for normal operations – 2 x 60 events/yr x 0.421 MMscf/hr) x controlled EF (lb/MMscf).
[g] Commissioning year rate calculated as total commissioning emissions (lb) + normal operation emissions (lb).
[h] Commissioning year monthly rate calculated as controlled emission factor (lb/MMscf) x (30 x 4.63 MMscf/day – 30 x 2 x 0.421 MMscf/hr – 25 hrs x 0.421 MMscf/hr) + (start-up emissions (lb/hr) x 30 + shut-down emissions (lb/hr) x 30) + total commissioning emissions (lbs)

CRITERIA POLLUTANTS EMISSIONS AND CALCULATIONS – BLACK START ICE

The power plant will be designed with "black start" capability. Therefore, SCE is also proposing to install a natural gas fired engine that will be used to start the turbine in the event that there is a blackout on the grid. The ICE will power the compressor and start the turbine. Operation of the ICE will discontinue upon the start-up of the turbine. There was a discrepancy between the applicant's information and the data provided by Waukesha on the bhp rating of the engine. The applicant provided an 865 bhp rating and Waukesha provided information that referenced 925 bhp. Information provided by SCE in Appendix E demonstrates that the equipment will not exceed the 865 bhp rating. SCE proposes that the ICE will operate 14 hours per year and only 30 minutes per event, which includes black start events. SCE is proposing the following emission limits: 1.25 g-NO_X/bhp-hr, 0.45 g-VOC/bhp-hr and 1.59 g-CO/bhp-hr. An initial source test will be required to verify compliance with these limits.

DATA

- Operating schedule is 1/2 hour per day and 7 hours per year (Applicant)
- ICE rating is 865 bhp (Applicant)
- Natural gas fuel usage is 6.43 MMBtu/hr (Applicant)
- Emissions limits are 1.25 g-NO_X/bhp-hr, 0.45 g-VOC/bhp-hr and 1.59 g-CO/bhp-hr (Applicant)
- SO_X emission limit is 5.88 x 10^{-4} lb/MMBtu (AP-42, Section 3.2, Table 3.2-2)
- PM_{10} emission limit is 3.84 x 10^{-2} lb/MMBtu (AP-42, Section 3.2, Table 3.2-2)

Table 13

Pollutant	Hourly Emissions									
	Emission Factors								Hourly Emissions	
NO_X	1.25	(g-NO_X/bhp-hr)	x	865	(bhp)	÷	454	(g/lb)	= **2.38**	(lb-NO_X/hr)
SO_X	5.88E-04	(lb-SO_X/MMbtu)	x	6.43	(MMbtu/hr)				= **0.00**	(lb-SO_X/hr)
PM_{10}	3.84E-02	(lb-PM_{10}/MMbtu)	x	6.43	(MMbtu/hr)				= **0.25**	(lb-PM_{10}/hr)
CO	1.59	(g-CO/bhp-hr)	x	865	(bhp)	÷	454	(g/lb)	= **3.03**	(lb-CO/hr)
VOC	0.45	(g-VOC/bhp-hr)	x	865	(bhp)	÷	454	(g/lb)	= **0.86**	(lb-VOC/hr)

Pollutant	Daily Emissions						
	Hourly Emissions			Hours per day		Daily Emissions	
NO_X	2.38	(lb-NO_X/hr)	x	0.5	(hrs/day)	= **1.19**	(lb-NO_X/day)
SO_X	0.00	(lb-SO_X/hr)	x	0.5	(hrs/day)	= **0.00**	(lb-SO_X/day)
PM_{10}	0.25	(lb-PM_{10}/hr)	x	0.5	(hrs/day)	= **0.12**	(lb-PM_{10}/day)
CO	3.03	(lb-CO/hr)	x	0.5	(hrs/day)	= **1.51**	(lb-CO/day)
VOC	0.86	(lb-VOC/hr)	x	0.5	(hrs/day)	= **0.43**	(lb-VOC/day)

Pollutant	Annual Emissions						
	Hourly Emissions			Hours per year		Annual Emissions	
NO_X	2.38	(lb-NOX/hr)	x	7	(hrs/year)	= **17**	(lb-NO_X/year)
SO_X	0.00	(lb-SOX/hr)	x	7	(hrs/year)	= **0**	(lb-SO_X/year)
PM_{10}	0.25	(lb-PM10/hr)	x	7	(hrs/year)	= **2**	(lb-PM_{10}/year)
CO	3.03	(lb-CO/hr)	x	7	(hrs/year)	= **21**	(lb-CO/year)
VOC	0.86	(lb-VOC/hr)	x	7	(hrs/year)	= **6**	(lb-VOC/year)

RULES EVALUATION

RULE 212 – STANDARDS FOR APPROVING PERMITS

(c)(1) This section requires a public notice for all new or modified permit units located within 1,000 feet of the outer boundary of a school. SCE indicated that the equipment is not located within 1,000 feet of the outer boundary of any K-12 schools. An online search was conducted to verify the applicant's claim (See Appendix B). Therefore, a public notice is not required for this section.

(c)(2) This section requires a public notice for all new or modified facilities that have on-site emission increases exceeding any of the daily maximums specified in subdivision (g) of this rule. As shown in Table 14, the increase in emissions exceeds the daily maximum limits for NO_X and PM_{10}. Therefore, a public notice is required for this section.

TABLE 14

Daily Limit Threshold to Trigger Public Notice			
Pollutant	Daily Emission [a] (lbs/day)	Threshold (lbs/day)	Triggers Public Notice?
NO_X	55.25	40	**Yes**
SO_X	2.97	60	No
PM_{10}	49.98	30	**Yes**
CO	75.92	220	No
VOC	15.42	30	No

[a] The daily emissions are calculated as GTG emissions (lb/day) + Black Start ICE emissions (lb/day)

Paragraph (g) requires that notification follow the procedures of 40 CFR51, Section 51.161(b), and 40 CFR124, section 124.10. Rule 212(g) also requires 1) the AQMD analysis and information submitted by the operator must be available for public inspection in an area affected, 2) notice by prominent advertisement in the affected area, and 3) mailing a copy of the notice to EPA, CARB, chief executives of the city and county where the source is located, any land use agencies, State and Federal Land Managers or Indian Governing Body whose lands may be affected by the project.

In addition to the above, Section 124.10 requires that the notice be sent to Federal and State agencies with jurisdiction over fish, shellfish, and wildlife resources and over coastal zone management plans, the Advisory Council on Historic Preservation, State and Historic Preservation Officers.

The applicant must also distribute the notification to all addresses within a ¼ mile radius of the facility.

(c)(3) This section requires a public notice for all new or modified permit units with increases in emissions of toxic air contaminants such that a person may be exposed to a Maximum Individual Cancer Risk (MICR) of greater than 1 X 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 10 X 10^{-6} using the risk assessment procedures and toxic air contaminants specified under Rule 1402; or greater than 10 X 10^{-6} during a lifetime (70 years) for facilities with one permit unit. The Health Risk Assessment for the project (verified as acceptable from Planning/Modeling in Appendix C) shows the MICR to be less than 1 X 10^{-6}; therefore, a public notice is not triggered under this section.

RULE 218 – CONTINUOUS EMISSION MONITORING

In accordance with Rule 218(c), (e), (f), the applicant is required to submit an "Application for CEMS" for CEMS for the GTG and required to adhere to retention of records requirements and reporting requirements once approval to operate CEMS is granted. Compliance with this rule is expected.

RULE 401 – VISIBLE EMISSIONS

Opacity is limited to less than 20 percent (Ringlemann No.1), as published by the United States Bureau of Mines. 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 from the combustion of pipeline quality gas and the use of the CO/oxidation catalyst and SCR. Therefore, compliance with this rule is expected.

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. Based on the results of the modeling and HRA, compliance with this rule is expected.

RULE 403 – FUGITIVE DUST

The purpose of this rule is to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. The provisions of this rule apply to any activity or man-made condition capable of generating fugitive dust. This rule prohibits emissions of fugitive dust beyond the property line of the emission source. The applicant will be taking steps to prevent and/or reduce or mitigate fugitive dust emissions from the project site. Such measures include stabilizing off-road traffic, parking areas, haul routes and soils to meet applicable performance standards

as well as directing traffic over established haul routes. The installation and operation of the power plant is expected to comply with this rule.

RULE 404 – PARTICULATE MATTER - CONCENTRATION

This rule states that a person shall not discharge into the atmosphere from any source, particulate matter in excess of the concentration at standard conditions, shown in Table 404(a). Where the volume discharged is between figures listed in the Table, the exact concentration permitted to be discharged shall be determined by linear interpolation. The provisions of the rule do not apply to the gas-fired GTG; therefore, the GTG is exempt from the requirements of this rule. The black start engine is expected to comply with this rule.

RULE 407 – LIQUID AND GASEOUS AIR CONTAMINANTS

This rule limits CO emissions to 2,000 ppmvd and SO_2 emissions to 500 ppmvd, averaged over 15 minutes. For CO, the GTG will meet the BACT limit of 6.0 ppmvd @ 15% O_2, 1-hr average, and will be conditioned as such. For SO_2, equipment which complies with Rule 431.1 is exempt from the SO_2 limit in Rule 407. The applicant will be required to comply with Rule 431.1 and thus the SO_2 limit in Rule 407 will not apply.

RULE 409 – COMBUSTION CONTAMINANTS

This rule restricts the discharge of contaminants from the combustion of fuel to 0.23 grams per cubic meter (0.1 grain per cubic foot) of gas, calculated to 12% CO_2, averaged over 15 minutes. The turbine is expected to meet this limit at the maximum firing load based on the calculations shown below. Compliance will be verified through the initial performance test.

$$Stack\ Exhaust\left(\frac{scf}{hr}\right) = F_d \times \frac{20.9}{20.9 - \%O_2}\ x\ 7000\ \frac{gr}{lb} \times TFD$$

where:
Fd: Dry F factor for fuel type, 8710 dscf/MMBtu
O2: Rule specific dry oxygen content in the effluent stream, 3%
TFD: Total fired duty measured at HHV, 441.7 MMBtu/hr

Stack flow = $8710(20.9/17.9)*441.7x10^{-6}$ = 4.49 MMscf/hr

Grain Loading = [(A x B)/(C x D)] x 7000 gr/lb

where:

A = PM_{10} emission rate during normal operation, 4.53 lb/hr

B = Rule specified percent of CO2 in the exhaust (12%)
C = Percent of CO2 in the exhaust (approx. 4.29% for natural gas)
D = Stack exhaust flow rate, 4.49 MMscf/hr

$$\text{Grain Loading} = \frac{4.53 \text{ lbs/hr} \times [(7000 \text{ grains/lb}) \times (12/4.29)]}{4.49 \text{ E+06 scf/hr}}$$

= 0.02 grains/scf

The black start engine is not subject to this rule.

RULE 431.1 – SULFUR CONTENT OF GASEOUS FUELS

This rule restricts the sale or use of gaseous fuels that exceed a sulfur content limit of 16 ppmv for natural gas, calculated as H_2S. The facility will purchase and use PUC regulated natural gas that has a sulfur content less than 16 ppmv calculated as H_2S; therefore, compliance is expected.

RULE 474 – FUEL BURNING EQUIPMENT

Since the equipment is expected to comply with BACT, the NO_X emissions should be well below the 125 ppmvd limit required by this rule. Compliance is expected.

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. Compliance is achieved if either the mass limit or the concentration limit is met. Mass PM_{10} emissions from the turbine are estimated at 4.53 lbs/hr, and 0.007 gr/scf during natural gas firing at maximum firing load (see calculations below). Therefore, compliance is expected. Compliance will be verified through the initial performance test.

$$Combustion\ Particulate\left(\frac{grain}{scf}\right) = \frac{PM_{10}, lb/hr}{Stack\ Exhaust\ Flow, scf/hr}\ x\ 7000\ \frac{gr}{lb}$$

Combustion particulate = (4.53/4.49E+06)*7000 = 0.007 gr/scf

REGULATION IX – STANDARDS OF PERFORMANCE FOR NEW STATIONARY SOURCES

40CFR Part 60 Subpart GG – STANDARDS OF PERFORMANCE FOR STATIONARY GAS TURBINES

Subpart GG is applicable to turbines with a heat input greater than 10 MMBtu/hour (10.7 gigajoules per hour). The turbine is subject to the requirements of 40 CFR 60 Subpart KKKK; therefore, the turbine is exempt from the requirements of this subpart per §60.4305(b).

40CFR Part 60 Subpart KKKK – STANDARDS OF PERFORMANCE FOR STATIONARY COMBUSTION TURBINES

Subpart KKKK establishes emission standards and compliance schedules for the control of emissions from stationary combustion turbines with a heat input greater than 10 MMBtu/hr (10.7 gigajoules per hour), based on higher heating value, which commenced construction, modification or reconstruction after February 18, 2005.

§60.4320(a) The turbine is natural gas-fired and has a heat input ≥ 50 MMBtu/hr and < 850 MMBtu/hr; therefore, it is subject to a NO_X emission limit of 25 ppmv @ 15% O_2 from Table 1 of the subpart. The turbine is required to meet a standard of 2.5 ppmv @ 15% O_2, which is more stringent than this subpart; therefore, compliance with this section is expected.

§60.4330(a)(2) Natural gas fuel burned in the turbine has a sulfur content of 0.0006 lb-SO_2/MMBtu, which is less than 0.06 lb-SO_2/MMBtu (26 ng-SO_2/J) required by this section. Therefore, compliance with the sulfur dioxide limits of this section is expected. SCE is proposing to demonstrate compliance with fuel supplier data showing the sulfur content of the fuel is less than 0.20 grains/100cf (for natural gas).

§60.4335 The LM6000PC SPRINT turbine uses water injection to help reduce NO_X to compliance levels. Monitoring is required and will be accomplished with a CEMS; therefore, compliance with this section is expected with a certified CEMS.

§60.4345 The CEMS is required to be certified according to the Performance Specification 2 (PS 2) in appendix B to this part. SCE will be required to file a CEMS application package with Source Test Engineering to certify the CEMS to meet the requirements of Rule 218 or 40CFR60 appendix B. Therefore, compliance with this section is expected.

§60.4400(a) An initial source test will be required per §60.8 and annually thereafter to demonstrate compliance with the NO_X and SO_2 limits. Compliance is expected.

RULE 1110.2 – EMISSIONS FROM GASEOUS- AND LIQUID- FUELED ENGINES

(h)(2) The black start ICE is an emergency engine that will operate less than 200 hours per year; therefore, it is exempt from the provisions of this rule.

RULE 1134 – EMISSIONS OF OXIDES OF NITROGEN FROM STATIONARY GAS TURBINES

This rule applies to gas turbines, 0.3 MW and larger, installed on or before August 4, 1989. Therefore, as a new installation, the proposed SCE turbine is not subject to this rule.

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, including SCE. The plants which are included in the RECLAIM program are no longer subject to the requirements of this rule. The proposed SCE peaker plant will not be in RECLAIM. However, the new simple cycle turbine does not fall under the definition of an "electric power generating system." Under the rule, an electric power generating system is defined as all boilers or replacement units and all alternative or advanced combustion devices. An advanced combustion device is further defined as a cogeneration, combined cycle, intercooled, chemically recuperated, or other advanced combustion turbine, while an alternative resource is solar, geothermal, wind generation, etc. Therefore, the proposed SCE turbine is not subject to the requirements of Rule 1135.

REGULATION X – NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

40CFR Part 63 Subpart YYYY - NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS FOR STATIONARY COMBUSTION TURBINES

This regulation applies to gas turbines located at major sources of HAP emissions. A major source is defined as a facility with emissions of 10 tpy or more of a single HAP or 25 tpy or more of a combination of HAPs. The emissions from this facility are less than the thresholds. Therefore, the facility is not a major source, and the requirements of this regulation do not apply.

REGULATION XIII – NEW SOURCE REVIEW

RULE 1303(a) – BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

This rule states that the Executive Officer shall deny the Permit to Construct for any new source which results in an emission increase of any non-attainment air contaminant, any ozone depleting compound, or ammonia unless the applicant can demonstrate that BACT is employed for the new source. This project is a new source with a potential for an increase in emissions and therefore, BACT is required. The LM6000PC Sprint gas turbine proposed will be operated on a simple cycle. A review of the District BACT Clearinghouse revealed the most current BACT determination for El Colton, LLC dated 2/17/04 for a LM6000 (Enhanced SPRINT) turbine rated at 465.5 MMBtu/hr. The BACT limits are shown in Table 15. SCE is proposing to install GE LM6000PC SPRINT turbine that has a performance guarantee from the manufacturer to meet the BACT limits shown in Table 15. However, SCE is proposing more stringent limits; lower NO_X limit and shorter averaging times. In addition, a similar turbine was permitted under A/N 439100 for Wellhead Power Colton, LLC that included the same BACT limits and averaging times as proposed by SCE. Therefore, the more stringent limits proposed will be BACT for the turbine.

TABLE 15

BACT REQUIREMENT		
Pollutant	BACT for Simple Cycle Turbines	Proposed BACT
NO_X	3.5 ppmvd, @ 15% O_2, 3-hour rolling avg.	2.5 ppmvd, @ 15% O_2, 1-hour avg.
SO_X	Pipeline quality natural gas - content ≤ 1 grain/100 scf	Pipeline quality natural gas - content ≤ 1 grain/100 scf
PM_{10}	Pipeline quality natural gas - S content ≤ 1 grain/100 scf	Pipeline quality natural gas - S content ≤ 1 grain/100 scf
CO	6.0 ppmvd, @ 15% O_2, 3-hour rolling avg.	6.0 ppmvd, @ 15% O_2, 1-hour avg.
VOC	2.0 ppmvd, @ 15% O_2, 3-hour rolling avg.	2.0 ppmvd, @ 15% O_2, 1-hour avg.
NH_3	5.0 ppmvd @ 15% O_2, 1-hour rolling avg.	5.0 ppmvd @ 15% O_2, 1-hour avg.

An initial source test will be required to verify compliance with the BACT limits in Table 15.

The black start ICE is also subject to BACT and will be installed for emergency purposes. A review of the District BACT Clearinghouse database identified two determinations for emergency spark ignited engines; OC Flood Control (A/N 359876, dated 10/2/99) and Disneyland Resort (A/N 360419, dated 5/11/00). The more recent determination for Disneyland Resort lists BACT limits of 1.5 g-NO_X/bhp-hr, 1.5 g-VOC/bhp-hr and 2.0 g-CO/bhp-hr. However, OC Flood Control lists BACT limits of 0.15 g-NO_X/bhp-hr, 0.15 g-VOC/bhp-hr and 0.60 g-CO/bhp-hr, which are more stringent. A statement that read *"AQMD is reconsidering the BACT requirement for future applications of this type"* is also included beside the emission limits. According to a discussion with Roy Olivares regarding the BACT determination, the engine is used for flood control and will operate for less than 200 hours per year; however, there might be circumstances where the use of the engine would exceed the 200 hour per year limit. Therefore, OC Flood Control proposed non-emergency BACT limits to allow them the flexibility to operate above the 200 hour limit. Since the OC Flood Control determination is based on a special case, the black start ICE proposed by Edison will not be subject to the more stringent BACT emission limits. SCE is proposing 1.25 g-NO_X/bhp-hr, 0.45 g-VOC/bhp-hr and 1.59 g-CO/bhp-hr.

The black start ICE will be required to perform a source test to verify compliance with these limits. The limits are in g/bhp-hr and will be converted to ppmvd @ 15% O_2 and are shown in Table 16.

DATA

- Natural gas F-factor is 8,710 dscf/MMBtu @ 68 °F (40 CFR 60, Appendix A-7, Table 19-2)
- Molar volume is 385.4 ft^3/lb-mole @ 68 °F
- BSFC is 0.006976 MMBtu/bhp-hr (Manufacturer's data)

TABLE 16

ICE COMPLIANCE LIMITS			
Pollutant	Emission Factor (g/bhp-hr)	Emission Factor (ppmvd @ 15% O_2)	Source
NO_X	1.25	107 [a]	Applicant
CO	1.59	224 [b]	Applicant
VOC	0.45	111 [c]	Applicant

[a] $$1.25\frac{g}{bhp-hr}\times\frac{1lb}{454g}\times\frac{1hp-hr}{0.006976MMBtu}\times 385.4\frac{ft^3}{lb-mole}\times\frac{1lb-mole}{46lb}\times\frac{1MMBtu}{8{,}710dscf}\times\frac{(20.9\%-15\%)}{20.9\%}\times 1\times 10^6\ parts$$

[b] $$1.59\frac{g}{bhp-hr}\times\frac{1lb}{454g}\times\frac{1hp-hr}{0.006976MMBtu}\times 385.4\frac{ft^3}{lb-mole}\times\frac{1lb-mole}{28lb}\times\frac{1MMBtu}{8{,}710dscf}\times\frac{(20.9\%-15\%)}{20.9\%}\times 1\times 10^6\ parts$$

[c] $$0.45\frac{g}{bhp-hr}\times\frac{1lb}{454g}\times\frac{1hp-hr}{0.006976MMBtu}\times 385.4\frac{ft^3}{lb-mole}\times\frac{1lb-mole}{16lb}\times\frac{1MMBtu}{8{,}710dscf}\times\frac{(20.9\%-15\%)}{20.9\%}\times 1\times 10^6\ parts$$

RULE 1303(b)(1) – MODELING

This rule states that the Executive Officer or designee shall, except as Rule 1304 applies, deny the Permit to Construct for any new or modified source which results in a net emission increase of any nonattainment air contaminant at a facility, unless the applicant substantiates with modeling that the new facility or modification will not cause a violation, or make significantly worse an existing violation according to Appendix A or other analysis approved by the Executive Officer or designee, of any state or national ambient air quality standards at any receptor location in the District.

The turbine is rated at 441.7 MMBtu/hr and as a result a more detailed modeling analysis is required. Tier 4 modeling was performed by SCE's consultant, ENSR, using the ISC-PRIME air dispersion model to provide downwind emission concentration estimates from the turbine and black start engine. Although it was included in the consultant's analysis, the black start engine will be used for emergency purposes for less than 200 hours per year and is exempt from modeling requirements per Rule 1304(a)(4).

The promulgation package which establishes AERMOD as the preferred air dispersion model in the EPA's "Guideline on Air Quality Models" in place of the ISC3 air dispersion model was signed by the Administrator of the US EPA on October 21, 2005. The package was then submitted to the Federal Register office and was published November 9, 2005. This rule became effective December 9, 2005. One year after this date, the new model - AERMOD - should be used for appropriate application as replacement for ISC3. During this one-year period, protocols for modeling analyses based on ISC3 which are submitted in a timely manner may be approved at the discretion of the appropriate Reviewing Authority. AQMD has determined that the ICS3 model is acceptable during the one year phase out period. SCE submitted the applications in a timely manner before the phase out period ended as shown in Table 1. The ISC-PRIME was used to refine the analysis. The ISC-PRIME air dispersion model contains the same building downwash algorithm as the US-EPA approved AERMOD dispersion model. The applicant has submitted modeling results for both a commissioning and non-commissioning year. The results of the air quality impact analysis show that during commissioning, start-up, shutdown, maintenance and normal operations, turbine operation will not cause a violation, or make significantly worse, an existing violation of any state or national ambient air quality standard at any receptor location within the South Coast Air Basin. The applicant's modeling analysis was submitted to and reviewed by AQMD modeling staff and no significant deficiencies in methodology were noted. This is evidenced by an internal AQMD memorandum from Ms. Jill Whynot to Mr. Michael Mills (see Appendix C), which states that the proposed project complies with Rules 1303 and 1401.

RULE 1303(b)(2) – EMISSION OFFSETS

This facility will be operating the turbine as a peaking unit which will be conditioned daily and annually based on fuel usage, in units of scf/day and scf/year, respectively. The fuel usage limits are listed in Table 2. Due to the fuel usage restrictions and a cap on annual emissions, offsets will not be required for any criteria pollutant as shown in Table 17, which compares the facility's emissions to the thresholds from table A of Rule 1304.

TABLE 17

Offset Threshold					
Equipment	Pollutant (lb/yr)				
	NO_X	SO_X	PM_{10}	CO	VOC
Turbine	7,328	408	6,849	10,152	2,047
SCR	0	0	0	0	0
Ammonia tank	0	0	0	0	0
Black start ICE	Exempt per Rule 1304(a)(4)				
Emergency ICE [a]	666	1	10	105	17
TOTAL (lb/yr)	7,994	409	6,859	10,257	2,064
TOTAL (tpy)	4.0	0.2	3.4	5.1	1.0
Offset Limit (tpy)	4	4	4	29	4
Offsets Required?	No	No	No	No	No

[a] A/N 393143 (refer to Appendix E)

RULE 1303(b)(3) – SENSITIVE ZONE RECEPTORS

Rule 1303(b)(3) states that unless credits are obtained from the Priority Reserve, facilities located in the South Coast Air Basin are subject to the Sensitive Zone requirements specified in Health & Safety Code Section 40410.5. This section is not applicable because the facility will not need to secure emission offsets.

RULE 1303(b)(4) – FACILITY COMPLIANCE

The new facility is expected to comply with all applicable Rules and Regulations of the AQMD.

RULE 1401 – NEW SOURCE REVIEW OF TOXIC AIR CONTAMINANTS

New Source Review for Toxic Air Contaminants (TAC) is applicable to applications deemed complete on or after June 1, 1990. It imposes specific limits for maximum individual cancer risk, cancer burden, and non-cancer acute and chronic hazard indices from new permit units, relocations, or modifications to existing permit units which emit toxic air contaminants listed in Table I of Rule 1401. The rule establishes allowable risks for permit units requiring new permits pursuant to Rules 201 or 203. The installation of the new gas turbine and associated air pollution control equipment is "new construction", and since there will be an increase in TAC, Rule 1401 applies. The black start engine is exempt from the requirements of this rule per Rule 1401(g)(1)(F).

DEFINITIONS:
Maximum Individual Cancer Risk (MICR) - The estimated probability of a potential maximally exposed individual contracting cancer as a result of exposure to toxic air contaminants over a period of 70 years for residential and 46 years for worker receptor locations. (The MICR calculations, if applicable, include any and all multi-pathway considerations).

Cancer Burden - The estimated increase in the occurrence of cancer cases in a population subject to a MICR of greater than or equal to one in one million (1×10^{-6}) resulting from exposure to toxic air contaminants.

Acute Hazard Index (HIA) - The ratio of the estimated maximum one-hour concentration of a toxic air contaminant for a potential maximally exposed individual to its acute reference exposure level.

Chronic Hazard Index (HIC) - The ratio of the estimated long-term level of exposure to a toxic air contaminant for a potential maximally exposed individual to its chronic reference exposure level.

In general, the following five requirements must be met before a permit to construct can be granted for any affected equipment:

1. The cumulative increase in maximum individual cancer risk shall not exceed one-in-a-million (1×10^{-6}) if T-BACT is not used; or,
2. The cumulative increase in maximum individual cancer risk shall not exceed ten-in-a-million (10×10^{-6}) if T-BACT is used.
3. The cumulative cancer burden (increases in cancer in the population) shall not exceed 0.5.
4. For target organ systems, neither the cumulative increase in total chronic hazard index (HIC) nor the total acute hazard index (HIA) shall exceed 1.0 for all target organ systems, or an alternate hazard index level deemed to be safe.

5. Rule 212(c)(3) requires public notification if the MICR, based on Rule 1401, exceeds 1 x 10^{-6}, due to a project's proposed construction, modification, or relocation for facilities with more than one permitted equipment, or facilities under RECLAIM or Title V, regardless of the number of equipment, unless the applicant can show the total facility-wide MICR is less than 10 x 10^{-6}. For facilities with only a single piece of permitted equipment, the MICR level must not exceed 10 x 10^{-6}. The circulation and distribution of the notifications must meet the criteria in Rule 212.

The applicant has conducted a Tier 4 health risk assessment (HRA) for Rule 1401 to evaluate the project's potential health risks. The HRA included the use of the ISC-PRIME dispersion model results which was used to determine the maximum downwind dispersion factor used for the air quality modeling calculations in Regulation XIII. Toxic pollutant emissions from the proposed project were derived from factors provided by USEPA AP-42 guidelines for natural gas fired gas turbines and the TAC emissions are based the fuel consumption rate of 441.7 MMBTU/hr. The TAC emissions are shown in Table 18.

TABLE 18

TAC	EF (lb/MMBtu)	Emission rate (lb/hr)	Annual Average Emission rate [a] (lb/yr)
1,3-Butadiene	4.30E-07	1.90E-04	3.07E-01
Acetaldehyde	4.00E-05	1.77E-02	2.86E+01
Acrolein	6.40E-06	2.83E-03	4.58E+00
Benzene	1.50E-05	6.63E-03	1.07E+01
Ethylbenzene	3.20E-05	1.41E-02	2.29E+01
Formaldehyde	7.10E-04	3.14E-01	5.08E+02
Naphthalene	1.30E-06	5.74E-04	9.30E-01
PAH [as benzo(a)pyrene]	2.20E-06	9.72E-04	1.57E+00
Propylene Oxide	2.90E-05	1.28E-02	2.07E+01
Toluene	1.30E-04	5.74E-02	9.30E+01
Xylene	6.40E-05	2.83E-02	4.58E+01

[a] The annual TAC emissions shown in the table and used in the HRA evaluation is based on the original proposed fuel consumption of 680 MMscf/yr. The conditioned fuel usage of 636 MMscf/yr will result in lower TAC emissions.

The memorandum for the review of the HRA is shown in Appendix C verifying that the proposed project complies with Rule 1401. Table 18 shows the risk and hazard index values for the LM6000 PC SPRINT and the acceptable Rule 1401 limits. Based on the calculated and reviewed values in Table 19, the equipment can be expected to comply with the requirements of Rule 1401. It should also be noted that because the residential and commercial MICR is below 1.0 x 10^{-6}, the cancer burden calculation does not have to be performed.

TABLE 19

Risk [a]	Results	Threshold	Compliance?
$MICR_r$	0.06×10^{-6}	$< 1.0 \times 10^{-6}$ (no T-BACT) $< 10 \times 10^{-6}$ (with T-BACT)	Yes
$MICR_c$	0.01×10^{-6}	$< 1.0 \times 10^{-6}$ (no T-BACT) $< 10 \times 10^{-6}$ (with T-BACT)	Yes
HIA_r	3.57×10^{-3}	< 1.0	Yes
HIA_c	3.57×10^{-3}	< 1.0	Yes
HIC_r	1.52×10^{-4}	< 1.0	Yes
HIC_c	3.31×10^{-4}	< 1.0	Yes

[a] Subscripts "r" and "c" denote residential and commercial receptors, respectively.

REGULATION XVII – PREVENTION OF SIGNIFICANT DETERIORATION

Due to revisions to 40 CFR 52.21, EPA has determined as of March 3, 2003, that the AQMD's Regulation XVII may no longer generally meet the CFR. As a result of this determination, the EPA has revoked and rescinded the AQMD's authority to implement the Prevention of Significant Deterioration (PSD) program for issuing and modifying federal permits for new and modified major sources of attainment pollutants. Therefore, the EPA will process all PSD permits, until authority is again granted to the AQMD for implementing the program. The AQMD has sent the applicant a notification to contact the EPA directly for applicability of PSD. This Regulation is inactive upon EPA's withdrawal of delegation.

REGULATION XXX – TITLE V PERMITS

The Title V Permit system is the air pollution control permit system required to implement the federal Operating Permit Program as required by Title V of the federal Clean Air Act as amended in 1990. This regulation defines permit application and issuance procedures as well as compliance requirements associated with the program.

Rule 3001(c)(3) requires that all "affected sources" as defined under the acid rain provisions of Title IV of the federal Clean Air Act and 40 CFR Part 70, §70.2 shall submit applications to the Executive Officer to obtain Title V permits in accordance with the timelines specified in Rule 3003 - Applications, or with federal regulations. 40 CFR §70.2 directs the meaning of affected source to §72.2, which defines it as a source that has one or more affected units. Affected unit is further defined as a unit that is subject to any Acid Rain emissions reduction requirement or Acid Rain emissions limitation under §72.6 or part 74 of this chapter. Section 72.6 states that an affected unit is subject to the requirements of the Acid Rain Program if it is a new utility unit.

SCE meets the definition of utility per §72.6. Therefore, a Title V permit is required for this facility. SCE submitted an initial Title V application. The initial Title V permit will be processed and the required public notice will run concurrently with the Rule 212(g) public notice, which is also required for this project. EPA is afforded the opportunity to review and comment on the project within a 45-day review period.

In addition to the parties receiving the notice under Rules 212, Rule 3006 requires the notice be sent to those who request in writing to be on a list and other means determined by the EO to insure adequate notice to the affected public. Rule 3006 also requires that the notice contain the following:

i) The identity and location of the affected facility;
(ii) The name and mailing address of the facility's contact person;
(iii) The identity and address of the South Coast Air Quality Management District as the permitting authority processing the permit;
(iv) The activity or activities involved in the permit action;
(v) The emissions change involved in any permit revision;
(vi) The name, address, and telephone number of a person who interested persons may contact to review additional information including copies of the proposed permit, the application, all relevant supporting materials, including compliance documents as defined in paragraph (b)(5) of Rule 3000, and all other materials available to the Executive Officer that are relevant to the permit decision;
(vii) A brief description of the public comment procedures provided; and,
(viii) The time and place of any proposed permit hearing that may be held or a statement of the procedures to request a proposed permit hearing if one has not already been requested.

Title V also allows for a 45 day review and comment period by the U.S. EPA.

A copy of the notice and the mailing list of those sent the notice is included in this file.

<u>40CFR Part 72 – ACID RAIN PROVISIONS</u>

SCE is subject to the requirements of the federal acid rain program as discussed above. This program is similar to RECLAIM in that facilities are required to cover SO_2 emissions with SO_2 allowances that are similar in concept to RECLAIM Trading Credits. SO_2 allowances are however, not required in any year when the unit emits less than 1,000 lbs of SO_2. Facilities with insufficient allowances are required to purchase SO_2 credits on the open market. Under this program, both NOx and SO_2 emissions will be monitored and reported directly to USEPA. The turbine will be fired with pipeline quality natural gas, with a sulfur content of less than 16 ppmv. Based on the above, compliance with this rule is expected.

40 CFR Part 64 – COMPLIANCE ASSURANCE MONITORING

The CAM regulation applies to emission units at major stationary sources required to obtain a Title V permit, which use control equipment to achieve a specified emission limit. The rule is intended to provide "reasonable assurance" that the control systems are operating properly to maintain compliance with the emission limits. The major source thresholds for the CAM rule and the facility emissions are summarized in Table 20 below.

TABLE 20

Major Source Thresholds		
Pollutant	Threshold (tpy)	Facility Emissions (tpy)
NO_X	10	4.0
SO_X	100	0.2
PM_{10}	70	3.4
CO	50	5.1
VOC	10	1.0

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

In accordance with the California Environmental Quality Act (CEQA), the South Coast Air Quality Management District (SCAQMD) is the Lead Agency and has prepared a Draft Mitigated Negative Declaration (MND) for the project. The Draft MND states the proposed project is expected to create significant adverse impacts to air quality during the construction phase but the impacts will be mitigated to less than significant. No other environmental topic areas will generate potential significant impacts. The Draft MND review period was from December 27, 2006 to January 25, 2007. The CEQA state clearinghouse number is 2006121113.

RECOMMENDATION

All applicable Rules and Regulations have been met. A permit to construct is recommended with the conditions shown on the following pages.

APPENDICES

APPENDIX A FACILITY EQUIPMENT LIST REPORT
APPENDIX B SCHOOLS LOCATED NEAR FACILITY
APPENDIX C MEMORANDUM ON MODELING AND HRA REVIEW APPROVAL
APPENDIX D CALCULATIONS
APPENDIX E ENGINEERING EVALUATION A/N 393143
APPENDIX F CORRESPONDENCE

CONDITIONS

FACILITY CONDITIONS

F9.1 Except for open abrasive blasting operations, the operator shall not discharge into the atmosphere from any single source of emissions whatsoever any air contaminant for a period or periods aggregating more than three minutes in any one hour which is:

(a) As dark or darker in shade as that designated No.1 on the Ringelmann Chart, as published by the United States Bureau of Mines; or

(b) Of such opacity as to obscure an observer' s view to a degree equal to or greater than does smoke described in subparagraph (a) of this condition.

[RULE 401, 3-2-1984; RULE 401, 11-9-2001]

F14.1 The operator shall not use diesel fuel containing sulfur compounds in excess of 15 ppm by weight as supplied by the supplier.

[RULE 431.2]

F24.1 Accidental release prevention requirements of Section 112(r)(7):

a). The operator shall comply with the accidental release prevention requirements pursuant to 40 CFR Part 68 and shall submit to the Executive Officer, as a part of an annual compliance certification, a statement that certifies compliance with all of the requirements of 40 CFR Part 68, including the registration and submission of a risk management plan (RMP).

b). The operator shall submit any additional relevant information requested by the Executive Officer or designated agency.

[40 CFR68]

GAS TURBINE

A63.1 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	1622 LBS IN ANY ONE MONTH
PM10	1496 LBS IN ANY ONE MONTH
CO	2232 LBS IN ANY ONE MONTH
SOx	89 LBS IN ANY ONE MONTH
VOC	450 LBS IN ANY ONE MONTH

The operator shall calculate the emission limit(s) by using fuel use data and the following emission factors: VOC: 3.09 lbs/mmcf, PM10: 10.77 lbs/mmcf, and SOx: 0.64 lbs/mmcf. THIS CONDITION APPLIES AFTER THE 1st 12 MONTHS OF OPERATION.

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors- NOx: 10.46 lb/mmcf and CO: 15.21 lbs/mmcf during normal operations, and NOx: 7.82 lbs/start, 6.61 lbs/shutdown, CO: 8.82 lbs/start, 7.95 lbs/shutdown.

[Rule 1303 – Offsets]

A63.4 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	2929 LBS IN ANY ONE MONTH
PM10	1496 LBS IN ANY ONE MONTH
CO	3326 LBS IN ANY ONE MONTH
SOx	89 LBS IN ANY ONE MONTH
VOC	535 LBS IN ANY ONE MONTH

The operator shall calculate the emission limit(s) by using fuel use data and the following emission factors: During commissioning with no control- NOx: 255.21 lbs/mmcf; CO: 119.18 lbs/mmcf, VOC: 11.25 lbs/mmcf; PM10: 10.77 lbs/mmcf, and SOx: 0.64 lb/mmcf . During commissioning with water injection- NOx: 104.60 lbs/mmcf, all other factors remain the same. During normal operation- VOC: 3.09 lbs/mmcf, PM10: 10.77 lbs/mmcf, and SOx: 0.64 lbs/mmcf. THIS CONDITION APPLIES DURING THE 1ST 12 MONTHS OF OPERATION ONLY.

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors- NOx: 10.46 lb/mmcf and CO: 15.21 lbs/mmcf during normal operations, and NOx: 7.82 lbs/start, 6.61 lbs/shutdown, CO: 8.82 lbs/start, 7.95 lbs/shutdown.

[Rule 1303 – Offsets]

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

CONTAMINANT	EMISSION LIMIT
NOx	7324 LBS IN ANY ONE YEAR
PM10	5847 LBS IN ANY ONE YEAR
CO	9593 LBS IN ANY ONE YEAR
SOx	349 LBS IN ANY ONE YEAR
VOC	1805 LBS IN ANY ONE YEAR

The operator shall calculate the emission limit(s) by using fuel use data and the following emission factors: During commissioning with no control- NOx: 255.21 lbs/mmcf; CO: 119.18 lbs/mmcf, VOC: 11.25 lbs/mmcf; PM10: 10.77 lbs/mmcf, and SOx: 0.64 lb/mmcf . During commissioning with water injection- NOx: 104.60

lbs/mmcf, all other factors remain the same. During normal operation- VOC: 3.09 lbs/mmcf, PM10: 10.77 lbs/mmcf, and SOx: 0.64 lbs/mmcf. THIS CONDITION APPLIES DURING THE 1ST 12 MONTHS OF OPERATION ONLY.

Compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors- NOx: 10.46 lbs/mmcf and CO: 15.21lbs/mmcf during normal operations, and NOx: 7.82 lbs/start, 6.61 lbs/shutdown, CO: 8.82 lbs/start, 7.95 lbs/shutdown.

For the purpose of this condition, the yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[Rule 1303 – Offsets]

A63.3 The operator shall limit emission from this equipment as follows:

CONTAMINANT	EMISSION LIMIT
NOx	7328 LBS IN ANY ONE YEAR
PM10	6849 LBS IN ANY ONE YEAR
CO	10152 LBS IN ANY ONE YEAR
SOx	408 LBS IN ANY ONE YEAR
VOC	2047 LBS IN ANY ONE YEAR

The operator shall calculate the emission limit(s) by using fuel use data and the following emission factors: VOC: 3.09 lbs/mmcf, PM10: 10.77 lbs/mmcf, and SOx: 0.64 lbs/mmcf. THIS CONDITION APPLIES AFTER THE 1st 12 MONTHS OF OPERATION.

The operator shall calculate the emission limit(s) and compliance with the NOx and CO emission limits shall be verified through CEMS data. If NOx and CO CEMS data is not available, NOx and CO emissions shall be calculated using fuel usage and the following factors- NOx: 10.46 lbs/mmcf and CO: 15.21lbs/mmcf during normal operations, and NOx: 7.82 lbs/start, 6.61 lbs/shutdown, CO: 8.82 lbs/start, 7.95 lbs/shutdown.

For the purpose of this condition, the yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[Rule 1303 – Offsets]

A99.1 The 2.5 PPM NOx emission limits shall not apply during commissioning, start-up, and shutdown periods. Commissioning shall not exceed 25 hrs, with no more than 5 hrs uncontrolled and no more than 20 hrs with water injection. Each start-up shall not exceed 15 min. Each shutdown shall not exceed 10 min. There shall be no more than 60 start ups per year in the first year of operation, and 120 start-ups per year thereafter. NOx emissions for the hour which includes a start shall not exceed 7.82 lbs, and for the hour which includes a shutdown 6.61 lbs.

[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A99.2 The 6.0 PPM CO emission limits shall not apply during commissioning, start-up, and shutdown periods. Commissioning shall not exceed 25 hrs, with no more than 5 hrs uncontrolled and no more than 20 hrs with water injection. Each start-up shall not exceed 15 min. Each shutdown shall not exceed 10 min. There shall be no more than 60 start ups per year in the first year of operation, and 120 start-ups per year thereafter. CO emissions for the hour which includes a start shall not exceed 8.82 lbs, and for the hour which includes a shutdown 7.95 lbs.
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A195.1 The 2.5 PPMV NOX emission limit(s) is averaged over 60 minutes at 15 percent O2, dry.
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A195.2 The 6.0 PPMV CO emission limit(s) is averaged over 60 minutes at 15 percent O2, dry.
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A195.3 The 2.0 PPMV VOC emission limit(s) is averaged over 60 minutes at 15 percent O2, dry.
[Rule 1303(a) – BACT, Rule 1303(b)(1) – Modeling, Rule 1303(b)(2) - Offsets]

A327.1 For the purpose of determining compliance with District Rule 475, combustion contaminants emissions may exceed the concentration limit or the mass emission limit listed, but not both limits at the same time.
[Rule 475]

D12.1 The operator shall install and maintain a(n) flow meter to accurately indicate the fuel usage being supplied to the turbine.

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.
[Rule 1303(b)(2) – Offset]

C1.1 The operator shall limit the fuel usage to no more than 4.63 mmcf in any one day.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition.
[Rule 1303(b)(2) – Offset]

C1.2 The operator shall limit the fuel usage to no more than 543 mmcf per year.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition and the records shall be made available upon AQMD request.

For the purpose of this condition, the yearly fuel use limit shall apply only during the 1st 12 months of operation.
[Rule 1303(b)(2) – Offset]

C1.3 The operator shall limit the fuel usage to no more than 636 mmcf per year.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition and the records shall be made available upon AQMD request.

For the purpose of this condition, the yearly fuel use limit shall apply after the 1st 12 months of operation. The yearly emission limit shall be defined as a period of twelve (12) consecutive months determined on a rolling basis with a new 12 month period beginning on the first day of each calendar month.

[Rule 1303(b)(2) – Offset]

D29.1 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NOX emissions	District Method 100.1	1 hour	Outlet of the SCR
CO emissions	District Method 100.1	1 hour	Outlet of the SCR
SOX emissions	Approved District method	District approved averaging time	Fuel Sample
VOC emissions	Approved District method	1 hour	Outlet of the SCR
PM10 emissions	Approved District method	District approved averaging time	Outlet of the SCR
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR

The test shall be conducted after AQMD approval of the source test protocol, but no later than 180 days after initial start-up. 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 to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at loads of 100, 75, and 50 percent.

For natural gas fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F.

The use of this alternative method for VOC compliance determination does not mean that it is more accurate than AQMD Method 25.3, nor does it mean that it may be used in lieu of AQMD Method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines.

Because the VOC BACT level was set using data derived from various source test results, this alternate VOC compliance method provides a fair comparison and represents the best sampling and analysis technique for this purpose at this time. The test results shall be reported with two significant digits.
[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

D29.2 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NH3 emissions	District method 207.1 and 5.3 or EPA method 17	1 hour	Outlet of the SCR

The test shall be conducted and the results submitted to the District within 45 days after the test date. The AQMD shall be notified of the date and time of the test at least 7 days prior to the test.

The test shall be conducted at least quarterly during the first twelve months of operation and at least annually thereafter. The NOx concentration, as determined by the CEMS, shall be simultaneously recorded during the ammonia slip test. If the CEMS is inoperable, 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.
[Rule 1303(a)(1) – BACT]

D29.3 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
SOX emissions	Approved District method	District approved averaging time	Fuel Sample
VOC emissions	Approved District method	1 hour	Outlet of the SCR
PM10 emissions	Approved District method	District approved averaging time	Outlet of the SCR

The test shall be conducted at least once every three years.

The test shall be conducted to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the turbine generating output in MW.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at 100 percent load.

The test shall be conducted for compliance verification of the BACT VOC 2.0 ppmv limit.

For natural gas fired turbines only, VOC compliance shall be demonstrated as follows: a) Stack gas samples are extracted into Summa canisters maintaining a final canister pressure between 400-500 mm Hg absolute, b) Pressurization of canisters are done with zero gas analyzed/certified to contain less than 0.05 ppmv total hydrocarbon as carbon, and c) Analysis of canisters are per EPA Method TO-12 (with pre concentration) and temperature of canisters when extracting samples for analysis is not below 70 deg F.

The use of this alternative method for VOC compliance determination does not mean that it is more accurate than AQMD Method 25.3, nor does it mean that it may be used in lieu of AQMD Method 25.3 without prior approval except for the determination of compliance with the VOC BACT level of 2.0 ppmv calculated as carbon for natural gas fired turbines.

Because the VOC BACT level was set using data derived from various source test results, this alternate VOC compliance method provides a fair comparison and represents the best sampling and analysis technique for this purpose at this time. The test results shall be reported with two significant digits.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

D82.1 The operator shall install and maintain a CEMS to measure the following parameters:

NOx and CO concentration in ppmv

Concentrations shall be corrected to 15 percent oxygen on a dry basis. The CEMS shall be installed and operating no later than 90 days after initial startup of the turbine, in accordance with an approved AQMD Rule 218 CEMS plan application. The operator shall not install the CEMS prior to receiving initial approval from AQMD.

The CEMS will convert the actual NOx and CO concentrations to mass emission rates (lbs/hr) and record the hourly emission rates on a continuous basis.

The CEMS shall be installed and operated to measure the NOx and CO concentration over a 15 minute averaging time period.

The CEMS shall convert the actual CO concentrations to mass emission rates (lbs/hr) using the equation below and record the hourly emission rates on a continuous basis.

CO Emission Rate, lbs/hr = K*Cco*Fd[20.9/(20.9%-%O2 d)][(Qg*HHV)/10E6], where

K = $7.267*10^{-8}$ (lbs/scf)/ppm
Cco = Average of 4 consecutive 15 min. average CO concentrations, ppm
Fd = 8710 dscf/MMBTU natural gas
%O2, d = Hourly average % by volume O2 dry, corresponding to Cco
Qg = Fuel gas usage during the hour, scf/hr
HHV = Gross high heating value of the fuel gas, BTU/scf

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset, Rule 218]

E193.1 The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the Negative Declaration prepared for this project (CEQA State Clearinghouse No. 2006121113).

[CEQA]

H23.1 This equipment is subject to the applicable requirements of the following rules or regulations:

CONTAMINANT	RULE	RULE/SUBPART
SOX	40CFR60 SUBPART	KKKK
NOX	40 CFR60 SUBPART	KKKK

[40 CFR 60 Subpart KKKK]

K40.1 The operator shall provide to the District a source test report in accordance with the following specifications:

Source test results shall be submitted to the District no later than 60 days after the source test was conducted.

Emission data shall be expressed in terms of concentration (ppmv) corrected to 15 percent oxygen (dry basis).

Emission data shall be expressed in terms of mass rate (lb/hr), and lb/MMCF. In addition, solid PM emissions, if required to be tested, shall also be reported in terms of grains/DSCF.
All exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute (DSCFM) and dry actual cubic feet per minute (DACFM).

All moisture concentration shall be expressed in terms of percent corrected to 15 percent oxygen.

Source test results shall also include the oxygen levels in the exhaust, fuel flow rate (CFH), the flue gas temperature, and the generator power output (MW) under which the test was conducted.

[Rule 1303(a)(1) – BACT, Rule 1303(b)(2) – Offset]

K67.1 The operator shall keep records in a manner approved by the District, for the following parameter(s) or item(s):

Commissioning hours and type of control and fuel use
Date and time of each start-up and shutdown
Natural gas fuel use after the commissioning period and prior to CEMS certification
[Rule 1303(b)(2) - Offsets]

SCR/CO CATALYST

A195.5 The 5 ppmv NH3 emission limit is averaged over 60 minutes at 15% O2, dry basis. The operator shall calculate and continuously record the NH3 slip concentration using the following:

NH3 (ppmv) = [a–b*c/1E+06]*1E+06/b

where,
a = NH3 injection rate (lbs/hr)/17(lb/lb-mol)
b = dry exhaust gas flow rate (scf/hr)/385.3 scf/lb-mol)
c = change in measured NOx across the SCR (ppmvd at 15% O2)

The operator shall install and maintain a NOx analyzer to measure the SCR inlet NOx ppmv accurate to plus or minus 5 percent calibrated at least once every twelve months. The NOx analyzer shall be installed and operated within 90 days of initial start-up.

The operator shall use the above described method or another alternative method approved by the Executive Officer.
The ammonia slip calculation procedures described above shall not be used for compliance determination or emission information without corroborative data using an approved reference method for the determination of ammonia.
[Rule 1303(a)(1) – BACT]

D12.2 The operator shall install and maintain a(n) flow meter to accurately indicate the flow rate of the total hourly throughput of injected ammonia.

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.
[Rule 1303(a)(1) – BACT]

D12.4 The operator shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the SCR catalyst bed in inches of 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.

[Rule 1303(a)(1) – BACT]

D12.6 The operator shall install and maintain a(n) temperature gauge to accurately indicate the temperature in 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.

[Rule 1303(a)(1) – BACT]

E179.1 For the purpose of the following condition number(s), continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour.

Condition Number D12.2
Condition Number D12.6

[Rule 1303(a)(1) – BACT]

E179.2 For the purpose of the following condition numbers, continuous monitoring shall be defined as measuring at least once every month and shall be calculated based upon the average of the continuous monitoring for that month.

Condition Number: D12.4

[Rule 1303(a)(1) – BACT]

E193.1 The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the Negative Declaration prepared for this project (CEQA State Clearinghouse No. 2006121113).

[CEQA]

BLACK START ENGINE

C1.4 The operator shall limit the operating time to no more than 7 hours in any one year.

The 7 hours per year limit may include up to a half hour per month operating time to maintain engine readiness.

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

D12.5 The operator shall install and maintain a non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

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

Pollutant to be tested	Required Test Method(s)	Averaging Time	Test Location
NOX emissions	District Method 100.1	1 hour	Outlet
CO emissions	District Method 100.1	1 hour	Outlet
VOC emissions	Approved District method	1 hour	Outlet

The test shall be conducted after AQMD approval of the source test protocol, but no later than 180 days after initial start-up. 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 to determine the oxygen levels in the exhaust. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the engine output in hp.

The test shall be conducted in accordance with AQMD approved test protocol. The protocol shall be submitted to the AQMD engineer no later than 45 days before the proposed test date and shall be approved by the AQMD before the test commences. The test protocol shall include the proposed operating conditions of the turbine during the tests, the identity of the testing lab, a statement from the testing lab certifying that it meets the criteria of Rule 304, and a description of all sampling and analytical procedures.

The test shall be conducted when this equipment is operating at a load of 100 percent.

The test shall be conducted for compliance verification of the NOx, CO, and VOC BACT limit.
[Rule 1303(a)(1) – BACT]

K67.2 The operator shall keep records, in a manner approved by the District, for the following parameters or items:

Date of operation, the elapsed time, in hours, and the reason for operation. Records shall be kept and maintained on file for a minimum of two years and made available to district personnel upon request
[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

E162.1 The operator shall use this equipment only during utility failure periods, except for maintenance purposes.
[Rule 1110.2, Rule 1304-Exemptions, Rule 1401]

E193.1 The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the Negative Declaration prepared for this project (CEQA State Clearinghouse No. 2006121113).
[CEQA]

E193.3 The operator shall operate and maintain this equipment according to the following specifications:

The TA Luft carburetor settings shall be maintained at all times
[Rule 1303-BACT]

AMMONIA TANK

E144.1 The operator shall vent this equipment, during filling, only to the vessel from which it is being filled.
[Rule 1303-BACT]

E193.1 The operator shall upon completion of construction, operate and maintain this equipment according to the following specifications:

In accordance with all mitigation measures stipulated in the Negative Declaration prepared for this project (CEQA State Clearinghouse No. 2006121113).
[CEQA]

C157.1 The operator shall install and maintain a pressure relief valve set at 50 psig.
[Rule 1303-BACT]

EMERGENCY DIESEL ENGINE

C1.5 The operator shall limit the operating time to no more than 199 hours in any one year.

The 199 hours per year limit may include up to 20 hours per year operating time to maintain engine readiness.

To comply with this condition, the operator shall install and maintain a(n) non-resettable elapsed time meter to accurately indicate the elapsed operating time of the engine.
[Rule 1110.2, Rule 1304-Exemptions, Rule 1401, Rule 1470]

E193.4 The operator shall operate and maintain this equipment according to the following specifications:

The operation of this equipment beyond 20 hours per year for testing and maintenance and performance testing shall be allowed only in the event of a loss of grid power or up to 30 minutes prior to a rotating outage, provided that the utility distribution company has ordered rotating outages in the control area where the engine is located or has indicated that it expects to issue such an order at a certain time, and the engine is located in a utility service block that is subject to the rotating outage.

Engine operation shall be terminated immediately after the utility distribution company advises that a rotating outage is no longer imminent or in effect.
[Rule 1470]

K67.6 The operator shall keep records, in a manner approved by the District, for the following parameters or items:

The date of operation

Indication of whether the engine is started manually or automatically

Time reading in hours at the beginning and end of operation

The elapsed time in hours

The reason for operation

The annual total hours of operation (include hours for manual and automatic operation) which shall be recorded no later than January 15th of the following year

The records shall be kept for a minimum of five calendar years prior to the current year and made available to District personnel upon request.

[Rule 1110.2, Rule 1304-Exemptions, Rule 1401, Rule 1470]

RULE 219 EXEMPT EQUIPMENT, COATING EQUIPMENT, PORTABLE, ARCHITECTURAL COATING

K67.4 The operator shall keep records, in a manner approved by the district, for the following parameter(s) or item(s):

For architectural applications where no thinners, reducers, or other VOC containing materials are added, maintain semi-annual records for all coating consisting of (a) coating type, (b) VOC content as supplied in grams per liter (g/l) of materials for low-solids coatings, (c) VOC content as supplied in g/l of coating, less water and exempt solvent, for other coatings.

For architectural applications where thinners, reducers, or other VOC containing materials are added, maintain daily records for each coating consisting of (a) coating type, (b) VOC content as applied in grams per liter (g/l) of materials used for low-solids coatings, (c) VOC content as applied in g/l of coating, less water and exempt solvent, for other coatings.

[Rule 3004 Periodic Monitoring]

RULE 219 EXEMPT EQUIPMENT REFRIGERATION UNITS

H23.3 This equipment is subject to the applicable requirements of the following rules or regulations:

CONTAMINANT	RULE	RULE/SUBPART
REFRIGERANTS	DISTRICT RULE	1415

[Rule 1415]