

APPENDIX 8.1A

Emissions Calculation and Support Data

Calculation of Maximum Hourly, Daily, and Annual Emissions

Tables presented in this Appendix are as follows:

- 8.1A-1 Ammonia Slip Emissions
- 8.1A-2 Facility Criteria Pollutant Emissions Calculations
- 8.1A-3 Turbine HAPs Emissions
- 8.1A-4 Cooling Tower Criteria Pollutant Emissions
- 8.1A-5 Cooling Tower HAPs Emissions
- 8.1A-6 Fire Pump Criteria Pollutant Emissions
- 8.1A-7 Fire Pump Engine HAPs Emissions
- 8.1A-8 Emergency Generator Criteria Pollutant Emissions
- 8.1A-9 Emergency Generator HAPs Emissions
- 8.1A-10 Commissioning Emissions
- 8.1A-11 Fuel Use Calculations
- 8.1A-12 Monthly Average Emissions per SCAQMD Rule 13

Calculation of ammonia emissions from the gas turbines is based on the proposed ammonia slip limit of 5 ppmvd.

TABLE 8.1A-1
Ammonia Emissions

Scenario (100% Load, 59°F) GE Case 103	Emissions 1 turbine	Emissions 5 turbines
Maximum hourly (lbs)	4.91	24.55
Maximum annual (tons), based on proposed annual operating scenario	11.9	59.5
Annualized hourly emissions (lbs), at 8,760 hrs/yr	2.717	13.584
Annualized emissions, g/sec	0.343	1.713

In addition to the above tables, other miscellaneous support data for the device-specific emissions calculations is also included in this Appendix.

Table 6.1A-2b
Detailed Calculations for Criteria Pollutant Air Quality Modeling Assessment

High

	Maximum Hourly, Daily and Annual Emissions																						
	max. hour	Base Load		Startup		Shutdown		NOx		SO2		CO		VOC		PM10							
	lb/hr	hrs/day	hrs/yr	lb/hr	hrs/day	hrs/yr	lb/hr	hrs/day	lb/day	lb/yr	lb/hr	hrs/day	lb/hr	hrs/day	lb/day	lb/yr	lb/hr	hrs/day	lb/hr	hrs/day	lb/day	lb/yr	
Turbine 1	1	20	4000	2	419	2	419	12	10.75	0.62	11.8	26.40	25.92	2.21	3.60	3.47	6.0						
Turbine 2	1	20	4000	2	419	2	419	12	10.75	0.62	11.8	26.40	25.92	2.21	3.60	3.47	6.0						
Turbine 3	1	20	4000	2	419	2	419	12	10.75	0.62	11.8	26.40	25.92	2.21	3.60	3.47	6.0						
Turbine 4	1	20	4000	2	419	2	419	12	10.75	0.62	11.8	26.40	25.92	2.21	3.60	3.47	6.0						
Turbine 5	1	20	4000	2	419	2	419	12	10.75	0.62	11.8	26.40	25.92	2.21	3.60	3.47	6.0						
Emergency generator	1	1	52	0	0	0	0	0	0	0.030	4.63	0	0	1.54	0.0	0.0	0.0						0.5020
Fire pump engine	0	0	52	0	0	0	0	0	0	0.004	0.16	0	0	0.1	0.0	0.0	0.0						0.06
Cooling tower	1	20	4000	2	419	2	419	0	0	0	0	0	0	0.0	0.0	0.0	0.0						0.444

	NOx			SO2			CO			VOC			PM10			Ammonia		
	Max	lb/day	tpy	Max	lb/day	tpy	Max	lb/day	tpy	Max	lb/day	tpy	Max	lb/day	tpy	Max	lb/day	tpy
Turbine 1	12.0	207.5	21.0	0.6	14.9	1.5	26.9	342.6	34.8	3.6	58.3	5.9	6.0	144.0	4.91	117.8	11.9	
Turbine 2	12.0	207.5	21.0	0.6	14.9	1.5	26.9	342.6	34.8	3.6	58.3	5.9	6.0	144.0	4.91	117.8	11.9	
Turbine 3	12.0	207.5	21.0	0.6	14.9	1.5	26.9	342.6	34.8	3.6	58.3	5.9	6.0	144.0	4.91	117.8	11.9	
Turbine 4	12.0	207.5	21.0	0.6	14.9	1.5	26.9	342.6	34.8	3.6	58.3	5.9	6.0	144.0	4.91	117.8	11.9	
Turbine 5	12.0	207.5	21.0	0.6	14.9	1.5	26.9	342.6	34.8	3.6	58.3	5.9	6.0	144.0	4.91	117.8	11.9	
Emergency generator	32.0	32.0	0.83	0.0	0.0	0.0008	4.6	4.6	0.1204	1.5	0.0400	0.0131	0.50	0.50	0.0	0.0	0.0	
Fire pump engine	0.0	0.0	0.09	0.0	0.0	0.0001	0.0	0.0	0.0047	0.0	0.0025	0.0015	0.00	0.00	0.0	0.0	0.0	
Cooling tower	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.444	1.07	0.0	0.0	0.0	
Total	92.0	1069.5	105.8	3.1	74.4	7.5	139.2	1,717.8	174.0	19.5	293.2	29.5	30.8	731.2	24.6	589.2	58.4	

Assumptions:
 Each turbine will startup in a 60 minute period, with all five starting up during a 1-hour time-frame.
 Emergency generator and fire pump will not both be tested on the same day.
 Fire pump will not be tested more than 50 hours per year.
 Emergency generator will not be tested over 50 hours per year.

TABLE 8.1A-3
Calculation of Noncriteria Pollutant Emissions for SVEP Turbines

Compound	Calculation of Noncriteria Pollutant Emissions from Gas Turbines (each turbine)				Emission Rates for Modeling (g/s each turbine)	
	Emission Factor, lb/MMscf (1)	Maximum Hourly Emissions, lb/hr/tur (2)	Maximum Daily Emissions, lb/day/tur	Annual Emissions, ton/yr/tur (3)	One-hour	Annual
					g/s/turbine	g/s/turbine
Acetaldehyde	4.08E-02	3.61E-02	8.65E-01	8.86E-02	4.54E-03	2.55E-03
Acrolein	3.69E-03	3.26E-03	7.83E-02	8.01E-03	4.11E-04	2.30E-04
Ammonia	(4)	4.91E+00	2.93E+02	1.19E+01	0.619	3.42E-01
Benzene	3.33E-03	2.94E-03	7.06E-02	7.23E-03	3.71E-04	2.08E-04
1,3-Butadiene	1.27E-04	1.12E-04	2.69E-03	2.76E-04	1.41E-05	7.93E-06
Ethylbenzene	1.79E-02	1.58E-02	3.80E-01	3.89E-02	1.99E-03	1.12E-03
Formaldehyde	1.10E-01	9.72E-02	2.33E+00	2.39E-01	1.22E-02	6.87E-03
Hexane	2.59E-01	2.29E-01	5.49E+00	5.62E-01	2.88E-02	1.62E-02
Naphthalene	1.33E-03	1.18E-03	2.82E-02	2.89E-03	1.48E-04	8.30E-05
PAHs (total)	1.65E-04	1.46E-04	3.49E-03	3.58E-04	1.83E-05	1.03E-05
Propylene	7.70E-01	6.80E-01	1.63E+01	1.67E+00	8.57E-02	4.81E-02
Propylene oxide	2.96E-02	2.62E-02	6.28E-01	6.43E-02	3.30E-03	1.85E-03
Toluene	7.10E-02	6.27E-02	1.51E+00	1.54E-01	7.90E-03	4.43E-03
Xylene	2.61E-02	2.31E-02	5.54E-01	5.67E-02	2.91E-03	1.63E-03

- Notes:
- (1) Provided by CARB CATEF database and other AFC values for similar sized turbines.
 - (2) Based on maximum hourly turbine fuel use of 1000 Btu/scf gives 883.63 MMBtu/hr/turbine (w/o duct burner) and fuel HHV of 1000 Btu/scf gives 0.8836 MMscf/hr/turbine.
 - (3) Based on maximum annual turbine fuel use of 1000 Btu/scf gives 4341.272 MMBtu/yr/turbine (w/o duct burner) and fuel HHV of 1000 Btu/scf gives 4341.2720 MMscf/yr/turbine.
 - (4) Based on 5 ppm ammonia slip from SCR system.
 - (5) Polycyclic aromatic hydrocarbons, excluding naphthalene (treated separately).

Table 8.1A-4

Expected Cooling Tower PM10 Emissions

Project:	EME-Sun Valley EC	Tower Dimensions	
Mfg:	Marley	Deck Height:	27.09 Ft. AGL
# Cells:	5	Deck Length:	210.7 Ft.
acfm/Cell:	860100	Deck Width:	36.67 Ft.
Drift Loss	0.0005 %	Fan Exit Height:	39.09 Ft. AGL
Drift Frac:	0.000005	Exhaust Fan Diam:	22 Ft.
Water Source:	Reclaim/Recycled Water	Operational Data:	
TDS (mg/l) * :	5000	Hrs/Day:	24
Cycles of Concentration:	7.4	Hrs/Yr:	4838
Circulating Water Rate (gpm):	35500		
Circulating Water Rate (MMlbs/hr):	17.74		
Total PM10 Emissions:	lbs/hr:	0.444	
	lbs/day:	10.65	
	tons/yr:	1.07	
	Hourly g/sec/cell:	0.0112	
	Annual g/sec/cell:	0.0062	(annualized for 8760 hours/yr)

* Total Maximum TDS expected in circulating water.

**TABLE 8.1A-5
Calculation of Noncriteria Pollutant Emissions from SVEP Cooling Tower**

Constituent	Calculation of Noncriteria Pollutant Emissions from Cooling Tower (all cells)				Emission Rates for Modeling (g/s each cell)	
	Concentration in Cooling Tower Water *	Maximum Hourly Emissions, lb/hr	Maximum Daily Emissions, lb/day	Annual Emissions, ton/yr	One-hour	Annual
					g/s/cell	g/s/cell
Ammonia	0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	0.016272	7.22E-09	1.73E-07	1.75E-08	1.82E-10	1.01E-10
Cadmium	0.000444	1.97E-10	4.73E-09	4.77E-10	4.97E-12	2.74E-12
Chromium	0.034763	1.54E-08	3.70E-07	3.73E-08	3.89E-10	2.15E-10
Copper	0.036982	1.64E-08	3.94E-07	3.97E-08	4.14E-10	2.29E-10
Lead	0.002589	1.15E-09	2.76E-08	2.78E-09	2.90E-11	1.60E-11
Mercury	0.000348	1.55E-10	3.71E-09	3.74E-10	3.89E-12	2.15E-12
Nickel	0.10281	4.56E-08	1.10E-06	1.10E-07	1.15E-09	6.35E-10
Silver	0.004438	1.97E-09	4.73E-08	4.77E-09	4.97E-11	2.74E-11
Zinc	1.0355	4.60E-07	1.10E-05	1.11E-06	1.16E-08	6.40E-09

Notes: (1) Emissions calculated from max total drift rate of 0.444 lb/hr for 5 cells
 (2) Daily emissions assumes: 24.0 hrs/day operation.
 (3) Annual emissions assumes: 4838.0 hrs/yr operation.

ppmw = mg/l

* Based on 7.4 cycles of concentration and avg constituents per water analysis data.

Table 8.1A-6 EXPECTED INTERNAL COMBUSTION ENGINE EMISSIONS

Liquid Fuel

Engine ID: Fire Pump

Mfg:	Clarke	Stack Data (per stack)	
Model:	JW6H-UF40	Height:	40 Ft.
Capacity:	0 Kw	Diameter:	5 inches
BHP:	300	Temp:	738 deg F
RPM:	2350	ACFM:	2058 at stack temp
Fuel:	#2 Diesel	O2:	%
Fuel Use:	14.5 Gph	H2O:	%
FuelHHV:	137000 Btu/gal	DSCFM:	at STP
mmbtu/hr:	1.99 HHV	Area:	0.137 Sq.Ft.
# of Cyl:	6	Velocity:	15029 Ft/Min
Engine Design:	Lean-Burn	Max Daily Op Hrs:	1
# of Exhaust Stacks:	1	Max Annual Op Hrs:	52
Fuel Wt:	6.87 Lbs/gal		
Fuel S:	0.05 % wt.		
Fuel S:	3.435 Lbs/1000 gal		
SO2:	6.87 Lbs/1000 gal		

Efs (g/bhp/hr)	Lb/Hr	Lb/Day	Tons/Yr
NOx	5.2	3.44	0.0893
CO	0.27	0.18	0.0046
VOC	0.15	0.10	0.0026
PM10	0.09	0.06	0.0015
SOx	0.0055	0.0036	0.0001
SOx(fuel)	NA	0.10	0.0026

Efs(lb/mmbtu)	Lb/Hr	Lb/Day	Tons/Yr
NOx	0	0	0
CO	0	0	0
VOC	0	0	0
PM10	0	0	0

Table 8.1A-7

Liquid Fuel IC Engine Air Toxics Emissions Calculations

Engine ID:	Fire Pump	Max Hrs/Day:	1
Fuel Type:	Diesel	Max Hrs/Yr:	52
Gal/Hr:	14.5		
Mgal/Hr:	0.0145		
Mgal/Yr:	0.754		

Substance	EF				Max Hr.	Annual
	lbs/Mgal	lbs/hr	lbs/yr	tons/yr	g/sec	g/sec
Acenaphtene	6.71E-04	9.73E-06	5.06E-04	2.53E-07	1.23E-06	7.28E-09
Acenaphthylene	1.02E-03	1.48E-05	7.69E-04	3.85E-07	1.87E-06	1.11E-08
Anthracene	2.23E-04	3.23E-06	1.68E-04	8.41E-08	4.08E-07	2.42E-09
Benzo-a-anthracene	9.60E-05	1.39E-06	7.24E-05	3.62E-08	1.76E-07	1.04E-09
BaP	7.90E-05	1.15E-06	5.96E-05	2.98E-08	1.44E-07	8.58E-10
Benzo-a-fluoranthene	1.12E-04	1.62E-06	8.44E-05	4.22E-08	2.05E-07	1.22E-09
Benzo-ghi-perylene	9.00E-05	1.31E-06	6.79E-05	3.39E-08	1.65E-07	9.77E-10
Benzo-k-fluoranthene	7.83E-05	1.14E-06	5.90E-05	2.95E-08	1.43E-07	8.50E-10
Chrysene	1.30E-04	1.89E-06	9.80E-05	4.90E-08	2.38E-07	1.41E-09
Dibenz-ah-anthracene	8.20E-05	1.19E-06	6.18E-05	3.09E-08	1.50E-07	8.90E-10
Fluoranthene	3.30E-04	4.79E-06	2.49E-04	1.24E-07	6.03E-07	3.58E-09
Fluorene	9.65E-04	1.40E-05	7.28E-04	3.64E-07	1.76E-06	1.05E-08
Indeno-123cd-pyrene	8.45E-05	1.23E-06	6.37E-05	3.19E-08	1.55E-07	9.17E-10
Naphthalene	1.60E-02	2.32E-04	1.21E-02	6.03E-06	2.93E-05	1.74E-07
Phenanthrene	3.54E-03	5.13E-05	2.67E-03	1.33E-06	6.47E-06	3.84E-08
Pyrene	2.64E-04	3.83E-06	1.99E-04	9.95E-08	4.83E-07	2.87E-09
Ethylbenzene	6.76E-03	9.80E-05	5.10E-03	2.55E-06	1.24E-05	7.34E-08
13 Butadiene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Acetaldehyde	3.47E-03	5.03E-05	2.62E-03	1.31E-06	6.35E-06	3.77E-08
Acrolein	1.07E-03	1.55E-05	8.07E-04	4.03E-07	1.96E-06	1.16E-08
Benzene	1.81E-01	2.62E-03	1.36E-01	6.82E-05	3.31E-04	1.96E-06
Formaldehyde	5.10E-02	7.40E-04	3.85E-02	1.92E-05	9.33E-05	5.54E-07
Propylene	3.41E-01	4.94E-03	2.57E-01	1.29E-04	6.24E-04	3.70E-06
Toluene	6.10E-02	8.85E-04	4.60E-02	2.30E-05	1.12E-04	6.62E-07
Xylenes	2.10E-02	3.05E-04	1.58E-02	7.92E-06	3.84E-05	2.28E-07
Hexane	1.39E-03	2.02E-05	1.05E-03	5.24E-07	2.54E-06	1.51E-08
Arsenic	1.60E-03	2.32E-05	1.21E-03	6.03E-07	2.93E-06	1.74E-08
Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cadmium	1.50E-03	2.18E-05	1.13E-03	5.66E-07	2.74E-06	1.63E-08
Hex Chromium	1.00E-04	1.45E-06	7.54E-05	3.77E-08	1.83E-07	1.09E-09
Copper	4.10E-03	5.95E-05	3.09E-03	1.55E-06	7.50E-06	4.45E-08
Lead	8.30E-03	1.20E-04	6.26E-03	3.13E-06	1.52E-05	9.01E-08
Manganese	3.10E-03	4.50E-05	2.34E-03	1.17E-06	5.67E-06	3.36E-08
Mercury	2.00E-03	2.90E-05	1.51E-03	7.54E-07	3.66E-06	2.17E-08
Nickel	3.90E-03	5.66E-05	2.94E-03	1.47E-06	7.13E-06	4.23E-08
Selenium	2.20E-03	3.19E-05	1.66E-03	8.29E-07	4.02E-06	2.39E-08
Zinc	2.24E-02	3.25E-04	1.69E-02	8.44E-06	4.10E-05	2.43E-07
Diesel PM	8.3E+00	1.20E-01	6.2E+00	3.12E-03	1.51E-02	8.99E-05

EFs: CARB-CATEF Database (mean values for source type and category)

Metals EFs from VCAPCD, 1/8/96

Table 8.1A-8 EXPECTED INTERNAL COMBUSTION ENGINE EMISSIONS

Liquid Fuel	Engine ID:	Gen Set		
Mfg: Caterpillar			Stack Data (per stack)	
Model: 3516B TA			Height: 40 Ft.	
Capacity: 1750 Kw			Diameter: 8 inches	
BHP: 2347			Temp: 797 deg F	
RPM: 2350			ACFM: 13843 at stack temp	
Fuel: #2 Diesel			O2: %	
Fuel Use: 119.3 Gph			H2O: %	
FuelHHV: 137000 Btu/gal			DSCFM: at STP	
mmbtu/hr: 16.34 HHV			Area: 0.351 Sq.Ft.	
# of Cyl: 12			Velocity: 39490 Ft/Min	
Engine Design: Lean-Burn			Max Daily Op Hrs: 1	
# of Exhaust Stacks: 1			Max Annual Op Hrs: 52	
Fuel Wt: 6.87 Lbs/gal				
Fuel S: 0.05 % wt.				
Fuel S: 3.435 Lbs/1000 gal				
SO2: 6.87 Lbs/1000 gal				
Efs (g/bhp/hr)	Lb/Hr	Lb/Day	Tons/Yr	
NOx 6.19	32.00	32.00	0.8320	
CO 0.89	4.60	4.60	0.1196	
VOC 0.3	1.55	1.55	0.0403	
PM10 0.1	0.52	0.52	0.0134	
SOx 0.0055	0.0284	0.0284	0.0007	
SOx(fuel) NA	0.82	0.82	0.0213	
Efs(lb/mmbtu)	Lb/Hr	Lb/Day	Tons/Yr	
NOx 0	0	0	0	
CO 0	0	0	0	
VOC 0	0	0	0	
PM10 0	0	0	0	

Table 8.1A-9

Liquid Fuel IC Engine Air Toxics Emissions Calculations

Engine ID:	Emer Gen Set	Max Hrs/Day:	1
Fuel Type:	Diesel	Max Hrs/Yr:	52
Gal/Hr:	119.3		
Mgal/Hr:	0.1193		
Mgal/Yr:	6.2036		

Substance	EF				Max Hr.	Annual
	lbs/Mgal	lbs/hr	lbs/yr	tons/yr	g/sec	g/sec
Acenaphthene	6.71E-04	8.01E-05	4.16E-03	2.08E-06	1.01E-05	5.99E-08
Acenaphthylene	1.02E-03	1.22E-04	6.33E-03	3.16E-06	1.53E-05	9.11E-08
Anthracene	2.23E-04	2.66E-05	1.38E-03	6.92E-07	3.36E-06	1.99E-08
Benzo-a-anthracene	9.60E-05	1.15E-05	5.96E-04	2.98E-07	1.44E-06	8.57E-09
BaP	7.90E-05	9.42E-06	4.90E-04	2.45E-07	1.19E-06	7.06E-09
Benzo-a-fluoranthene	1.12E-04	1.34E-05	6.95E-04	3.47E-07	1.69E-06	1.00E-08
Benzo-ghi-perylene	9.00E-05	1.07E-05	5.58E-04	2.79E-07	1.35E-06	8.04E-09
Benzo-k-fluoranthene	7.83E-05	9.34E-06	4.86E-04	2.43E-07	1.18E-06	6.99E-09
Chrysene	1.30E-04	1.55E-05	8.06E-04	4.03E-07	1.96E-06	1.16E-08
Dibenz-ah-anthracene	8.20E-05	9.78E-06	5.09E-04	2.54E-07	1.23E-06	7.32E-09
Fluoranthene	3.30E-04	3.94E-05	2.05E-03	1.02E-06	4.96E-06	2.95E-08
Fluorene	9.65E-04	1.15E-04	5.99E-03	2.99E-06	1.45E-05	8.62E-08
Indeno-123cd-pyrene	8.45E-05	1.01E-05	5.24E-04	2.62E-07	1.27E-06	7.55E-09
Naphthalene	1.60E-02	1.91E-03	9.93E-02	4.96E-05	2.41E-04	1.43E-06
Phenanthrene	3.54E-03	4.22E-04	2.20E-02	1.10E-05	5.33E-05	3.16E-07
Pyrene	2.64E-04	3.15E-05	1.64E-03	8.19E-07	3.97E-06	2.36E-08
Ethylbenzene	6.76E-03	8.06E-04	4.19E-02	2.10E-05	1.02E-04	6.04E-07
1,3-Butadiene	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Acetaldehyde	3.47E-03	4.14E-04	2.15E-02	1.08E-05	5.22E-05	3.10E-07
Acrolein	1.07E-03	1.28E-04	6.64E-03	3.32E-06	1.61E-05	9.56E-08
Benzene	1.81E-01	2.16E-02	1.1E+00	5.61E-04	2.72E-03	1.62E-05
Formaldehyde	5.10E-02	6.08E-03	3.16E-01	1.58E-04	7.67E-04	4.55E-06
Propylene	3.41E-01	4.07E-02	2.1E+00	1.06E-03	5.13E-03	3.05E-05
Toluene	6.10E-02	7.28E-03	3.78E-01	1.89E-04	9.18E-04	5.45E-06
Xylenes	2.10E-02	2.51E-03	1.30E-01	6.51E-05	3.16E-04	1.88E-06
Hexane	1.39E-03	1.66E-04	8.62E-03	4.31E-06	2.09E-05	1.24E-07
Arsenic	1.60E-03	1.91E-04	9.93E-03	4.96E-06	2.41E-05	1.43E-07
Beryllium	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Cadmium	1.50E-03	1.79E-04	9.31E-03	4.65E-06	2.26E-05	1.34E-07
Hex Chromium	1.00E-04	1.19E-05	6.20E-04	3.10E-07	1.50E-06	8.93E-09
Copper	4.10E-03	4.89E-04	2.54E-02	1.27E-05	6.17E-05	3.66E-07
Lead	8.30E-03	9.90E-04	5.15E-02	2.57E-05	1.25E-04	7.41E-07
Manganese	3.10E-03	3.70E-04	1.92E-02	9.62E-06	4.66E-05	2.77E-07
Mercury	2.00E-03	2.39E-04	1.24E-02	6.20E-06	3.01E-05	1.79E-07
Nickel	3.90E-03	4.65E-04	2.42E-02	1.21E-05	5.87E-05	3.48E-07
Selenium	2.20E-03	2.62E-04	1.36E-02	6.82E-06	3.31E-05	1.96E-07
Zinc	2.24E-02	2.67E-03	1.39E-01	6.95E-05	3.37E-04	2.00E-06
Diesel PM	8.3E+00	9.88E-01	5.1E+01	2.57E-02	1.25E-01	7.39E-04

EFs: CARB-CATEF Database (mean values for source type and category)

Metals EFs from VCAPCD, 1/8/96

TABLE 8.1A-10
Commissioning Emissions

Commissioning Phase	1	2	3	4	5	6	Total
Water Injection	No	No	50%	Yes	Yes	Yes	
SCR Installed	No	No	No	No	50%	Yes	
CO Catalyst Installed	No	No	No	No	Yes	Yes	
Hours per Unit	20	14	24	12	24	40	134
# Units Operating Simultaneously *	4	3	1	5	5	5	
Avg Load %	0	5	50	100	75	100	
NOx lb/hr	91	99	175	81	35	8.1	
CO lb/hr	55	60	168	255	9	12	
VOC lb/hr	2	2	3	5	4	2	
MMBtu/hr - HHV	150	180	500	900.5	700	900.5	
NOx lb/mmscf	641	581	370	95	53	9	
CO lb/mmscf	387	352	355	299	14	14	
VOC lb/mmscf	14	12	6	6	6	2	
Total NOx lbs (5 units)	9,100	6,930	21,000	4,860	4,200	1,620	47,710
Total CO lbs (5 units)	5,500	4,200	20,160	15,300	1,080	2,400	48,640
Total VOC lbs	200	140	360	300	480	400	1,880

* Assume this number of units operate simultaneously at condition stated with the remaining units operating at fully commissioned full output conditions.

Nat. Gas MMBtu/mmscf 1056
Number of GT Units 5

Phase	Description
1	Pre-break in checkout
2	Controlled break-in run
3	Water injection commissioning
4	Complete AVR commissioning
5	SCR commissioning
6	Full load testing & checkout

Assume that water injection is 50% effective

Assume that NOx SCR is 50% effective and CO catalyst is 100% effective

TABLE 8.1A-12

South Coast AQMD Monthly Emissions Calculations (lbs)

		lbs/hr	lbs/day	31 day	30 day avg	Offsets Req'd		Annual
				lbs/month	lbs/month	lbs/month	lb-day	TPY
Cooling Tower	PM10	0.444	10.7	330.3	319.7	383.6	13	0.8
Fire Pump	NOx	3.44	3.44	17.2	16.6			0.086
	CO	0.2	0.2	1.0	1.0	1.2	0	0.005
	VOC	0.1	0.1	0.5	0.5	0.6	0	0.003
	PM10	0.06	0.06	0.3	0.3	0.3	0	0.002
	SOx	0.004	0.004	0.0	0.0			0.0001
Turbine 1	NOx	8.1	200.8	3951.2	3823.7			14.9
	CO	11.8	326.8	6441.6	6233.8	7480.6	249	24.8
	VOC	2.21	56.0	1102.72	1067.1	1280.6	43	4.2
	PM10	6	141.2	2776	2686.5	3223.7	107	10.4
	SOx	0.62	14.6	286.853333	277.6			1.1
	NH3	4.91	115.5	2271.69333	2198.4			8.5
Turbine 2	NOx	8.1	200.8	3951.2	3823.7			14.9
	CO	11.8	326.8	6441.6	6233.8	7480.6	249	24.8
	VOC	2.21	56.0	1102.72	1067.1	1280.6	43	4.2
	PM10	6	141.2	2776	2686.5	3223.7	107	10.4
	SOx	0.62	14.6	286.853333	277.6			1.1
	NH3	4.91	115.5	2271.69333	2198.4			8.5
Turbine 3	NOx	8.1	200.8	3951.2	3823.7			14.9
	CO	11.8	326.8	6441.6	6233.8	7480.6	249	24.8
	VOC	2.21	56.0	1102.72	1067.1	1280.6	43	4.2
	PM10	6	141.2	2776	2686.5	3223.7	107	10.4
	SOx	0.62	14.6	286.853333	277.6			1.1
	NH3	4.91	115.5	2271.69333	2198.4			8.5
Turbine 4	NOx	8.1	200.8	3951.2	3823.7			14.9
	CO	11.8	326.8	6441.6	6233.8	7480.6	249	24.8
	VOC	2.21	56.0	1102.72	1067.1	1280.6	43	4.2
	PM10	6	141.2	2776	2686.5	3223.7	107	10.4
	SOx	0.62	14.6	286.853333	277.6			1.1
	NH3	4.91	115.5	2271.69333	2198.4			8.5
Turbine 5	NOx	8.1	200.8	3951.2	3823.7			14.9
	CO	11.8	326.8	6441.6	6233.8	7480.6	249	24.8
	VOC	2.21	56.0	1102.72	1067.1	1280.6	43	4.2
	PM10	6	141.2	2776	2686.5	3223.7	107	10.4
	SOx	0.62	14.6	286.853333	277.6			1.1
	NH3	4.91	115.5	2271.69333	2198.4			8.5

Max Month Avg Daily Emissions (lb-day) (adjusted for the ERC ratio)	NOx	CO	VOC	PM10	SOx
	N/A	1246.8	213.4	550.1	N/A

Total Annual Emissions (tons):	NOx	CO	VOC	PM10	SOx
	74.77	123.81	20.92	52.80	5.38
	RTCs				RTCs

Monthly Operations Data		Max Month = 31 days		Normal	Startup	Shutdown	
		Annual	Max Month	lbs/hr	lb/event	lb/event	
Base				NOx	8.1	7	4.3
	Hours	3200	432	CO	11.8	15.4	18.2
	Startups	350	40	VOC	2.21	2.1	1.6
	Shutdowns	350	40	PM10	6	3.5	1.1
	Total	3468	463	SOx	0.62	0.36	0.11
				NH3	4.91	2.86	0.90

RTCs for NOx and SOx based on a 1:1 ratio.

ERC ratio for PM10, VOC, and CO is 1.2:1

IC Heat Extraction, bli/s 16763 0.0 10577 24475 19046 12361 26950 21072 13424 26649 20807 13219 26042 20285 13357
 KOD Water Extraction, lbs/s 0.0 0.0 0.0 0.0 0.0 0.0 1.7 1.1 0.2 1.4 0.8 0.0 0.7 0.2 0.0

Control Parameters

HP Speed, RPM 9304 9121 8945 9350 9144 8969 9357 9150 8979 9357 9150 8979 9357 9150 8975
 LP Speed, RPM 5246 4802 4578 5332 4889 4665 5272 4942 4719 5273 4942 4719 5274 4945 4723
 PT Speed, RPM 3600 3600 3600 3600 3600 3600 3600 3600 3600 3600 3600 3600 3600 3600 3600
 PS3 - CDP, psia 567.0 470.6 364.1 553.9 461.2 357.2 525.0 438.2 340.6 525.7 438.8 340.6 525.8 438.9 340.8
 T23 - Inlet Inlet Temp, °F 304.8 279.6 242.7 329.7 329.7 269.4 345.8 325.6 288.2 346.2 325.6 288.2 348.5 328.3 290.7
 P23 - Inlet Inlet Pressure, psia 55.8 50.4 42.5 54.0 49.3 41.6 51.4 47.1 39.9 51.4 47.1 39.9 51.4 47.2 40.0
 W23 - Inlet Inlet Flow, lbs/s 451.1 393.2 343.8 438.2 377.8 331.2 417.4 360.2 316.0 417.7 360.3 316.2 417.0 359.8 315.8
 T25 - HPC Inlet Temp, °F 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0 100.0
 T3CRF - CDT, °F 723 690 661 725 688 660 721 685 657 721 685 657 721 685 657
 T48IN, °R 2013 1934 1868 2031 1942 1877 2031 1943 1879 2031 1943 1879 2031 1943 1878
 T48IN, °F 1553 1475 1408 1571 1482 1417 1572 1483 1419 1572 1483 1419 1572 1483 1419

Exhaust Parameters

Temperature, °F 761.6 747.9 765.2 781.6 760.1 777.7 796.6 775.7 793.5 796.2 775.4 793.2 796.1 775.3 792.6
 lb/sec 469.3 399.6 316.2 455.5 390.2 309.0 431.3 370.2 293.8 432.0 370.7 294.2 432.0 370.8 294.5
 lb/hr 1689503 1438390 1138229 1639789 1404741 1112333 1552794 1332730 1057689 1555029 1334518 1058981 1555360 1334755 1060148
 Energy, Btu/s-ref 0 °R 147783 123572 98734 146566 122430 97924 140846 118056 94776 141000 118177 94866 141020 118194 94820
 Cp, Btu/lb-R 0.2742 0.2718 0.2707 0.2763 0.2733 0.2723 0.2774 0.2747 0.2741 0.2774 0.2747 0.2741 0.2773 0.2747 0.2738

Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)

NOx ppmvd Ref 15% O2 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25
 NOx as NO2, lb/hr 81 63 46 80 62 46 75 59 43 75 59 44 75 59 44
 CO ppmvd Ref 15% O2 144 149 132 129 126 108 115 107 80 115 107 80 115 107 85
 CO, lb/hr 282.76 229.64 148.93 249.82 191.71 119.89 211.11 153.49 84.89 211.64 153.91 85.32 211.82 154.04 90.65
 CO2, lb/hr 104573.10 82019.13 60263.20 103080.40 80704.15 58395.87 97493.02 76580.73 56515.52 97634.09 76686.30 56591.03 97651.41 76701.73 56634.83
 HC ppmvd Ref 15% O2 7 7 6 6 6 4 5 4 2 5 4 2 5 4 2
 HC, lb/hr 7.72 6.39 3.85 6.37 4.82 2.64 4.95 3.36 1.26 4.96 3.37 1.28 4.97 3.38 1.51
 SOx as SO2, lb/hr 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00

Maximum Emissions - Turbine

NOx ppmvd Ref 15% O2 25 25 25 25 25 25 25 25 25 25 25 25 25 25 25
 CO ppmvd Ref 15% O2 168 168 168 148 148 148 139 139 139 139 139 139 138 138 138
 VOC ppmvd Ref 15% O2 4.2 4.2 3.6 3.6 3.6 2.4 3.0 3.0 2.4 3.0 2.4 2.4 2.4 2.4 2.4
 PM10 lbs/hr 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0 6.0

Predicted (P) / Guaranteed Emissions - Stack

NOx ppmvd Ref 15% O2 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5 2.5 / 2.5
 NOx as NO2, lb/hr 8.1 6.3 4.6 8.0 6.2 4.6 7.5 5.9 4.3 7.5 5.9 4.4 7.5 5.9 4.4 7.5
 NH3 Slip ppmvd Ref 15% O2 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0
 CO ppmvd Ref 15% O2 6.3 (P) 6.3 (P) 6.3 (P) 5.6 / 6.0 5.6 / 6.0 5.6 / 6.0 5.3 / 6.0 5.3 / 6.0 5.3 / 6.0 5.3 / 6.0 5.3 / 6.0 5.2 / 6.0 5.2 / 6.0 5.2 / 6.0 5.2 / 6.0
 CO, lb/hr 12.4 9.7 7.1 10.9 / 11.6 8.5 / 9.2 6.2 / 6.7 9.7 / 11.0 7.6 / 8.6 5.6 / 6.4 9.8 / 11.1 7.6 / 8.7 5.7 / 6.4 9.8 / 11.1 7.5 / 8.7 5.6 / 6.4
 VOC ppmvd Ref 15% O2 2.8 (P) 2.8 (P) 2.4 (P) 2.3 (P) 2.4 (P) 1.6 (P) 1.9 (P) 1.6 (P)
 VOC, lb/hr 3.1 2.6 1.6 2.5 1.9 1.1 1.9 1.4 0.5 1.9 1.4 0.5 1.9 1.4 0.5 1.4
 PM10 lbs/hr

Based on the stated level of SOx (i.e. 0), there should be no particulate contribution from the catalysis.

Estimated Average Engine Performance NOT FOR GUARANTEE



GE Energy

Performance By: Johnny Metcalf
Project Info:

Engine: LMS100 PA
Deck Info: G0179C - 87o.scp
Generator: BDAX 98-330ER 60Hz, 13.8kV, 0.9PF (35410)
Fuel: Site Gas Fuel#900-1056, 20629 Btu/lb,LHV

Date: 08/09/2005
Time: 2:44:28 PM
Version: 3.3.6

Case #	100	101	102	103	104	105	106	107	108
Ambient Conditions									
Dry Bulb, °F	84.0	84.0	84.0	90.0	90.0	90.0	110.0	110.0	110.0
Wet Bulb, °F	70.7	70.7	70.7	69.7	69.7	69.7	67.9	67.9	67.9
RH, %	53.0	53.0	53.0	37.0	37.0	37.0	10.0	10.0	10.0
Altitude, ft	1460.0	1460.0	1460.0	1640.0	1640.0	1640.0	1460.0	1460.0	1460.0
Ambient Pressure, psia	13.937	13.937	13.937	13.846	13.846	13.846	13.937	13.937	13.937
Engine Inlet									
Comp Inlet Temp, °F	84.0	84.0	84.0	90.0	90.0	90.0	110.0	110.0	110.0
RH, %	53.0	53.0	53.0	37.0	37.0	37.0	10.0	10.0	10.0
Conditioning	NONE								
Tons or kBtu/hr	0	0	0	0	0	0	0	0	0
Pressure Losses									
Inlet Loss, inH2O	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.50
Exhaust Loss, inH2O	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
Partload %	100	75	50	100	75	50	100	75	50
kW, Gen Terms	91737	68825	45903	89891	67441	44981	86273	64729	43173
Est. Btu/kW-hr, LHV	7998	8374	9271	8030	8418	9324	8163	8570	9503
Guar. Btu/kW-hr, LHV	8331	8723	9657	8365	8768	9712	8503	8927	9899
Fuel Flow									
MMBtu/hr, LHV	733.7	576.3	425.5	721.9	567.7	419.4	704.2	554.7	410.3
lb/hr	35566	27937	20629	34992	27519	20330	34138	26889	19889
NOx Control									
	Water								
Water Injection									
lb/hr	27543	18335	11204	27273	18517	11451	28984	19977	12582
Temperature, °F	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Intercooler									
	Water-Air								
Humidification	OFF								
IC Heat Extraction, btu/s	26366	20657	13817	25956	20733	14059	27176	21888	15157
KOD Water Extraction, lb/s	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Parameters									
HP Speed, RPM	9357	9148	8971	9355	9144	8964	9344	9128	8942
LP Speed, RPM	5272	4969	4747	5273	4984	4760	5299	5034	4805
PT Speed, RPM	3600	3600	3600	3600	3600	3600	3600	3600	3600
PS3 - CDP, psia	514.9	430.2	334.6	506.7	423.6	329.8	493.7	413.4	322.8
T23 - Intcrl Inlet Temp, °F	358.2	338.2	300.8	364.9	344.8	307.6	386.2	366.1	329.5
P23 - Intcrl Inlet Pressure, psia	50.4	46.3	39.3	49.6	45.6	38.8	48.2	44.4	38.0
W23 - Intcrl Inlet Flow, lb/s	408.3	352.7	309.6	401.2	347.1	304.4	390.6	338.6	296.3
T25 - HPC Inlet Temp, °F	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
T3CRF - CDT, °F	720	684	657	720	685	657	722	686	657
T48IN, °R	2031	1942	1878	2031	1943	1877	2031	1942	1874
T48IN, °F	1572	1483	1418	1572	1483	1417	1571	1482	1414
Exhaust Parameters									
Temperature, °F	801.9	780.8	797.4	804.6	783.4	799.1	813.0	791.2	804.5
lb/sec	423.0	363.5	289.2	416.3	358.0	285.2	406.0	349.7	279.6
lb/hr	1522954	1308436	1041046	1498790	1288642	1026631	1461495	1258984	1006699
Energy, Btu/s- ref 0 °R	138769	116414	93483	136802	114790	92199	133904	112501	90479
Cp, Btu/lb-R	0.2776	0.2749	0.2739	0.2775	0.2747	0.2736	0.2769	0.2739	0.2727

Estimated Average Engine Performance NOT FOR GUARANTEE



GE Energy

Performance By: Johnny Metcalf
Project Info:

Engine: LMS100 PA
Deck Info: G0179C - 87o.scp
Generator: BDAX 98-330ER 60Hz, 13.8kV, 0.9PF (35410)
Fuel: Site Gas Fuel#900-1056, 20629 Btu/lb,LHV

Date: 08/09/2005
Time: 2:44:28 PM
Version: 3.3.6

Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)

NOx ppmvd Ref 15% O2	25	25	25	25	25	25	25	25	25
NOx as NO2, lb/hr	74	58	43	73	57	42	71	56	41
CO ppmvd Ref 15% O2	114	105	84	115	109	89	130	127	109
CO, lb/hr	204.70	148.49	87.73	203.14	151.72	91.57	223.57	173.07	109.10
CO2, lb/hr	95584.27	75157.44	55568.98	94040.90	74024.34	54755.95	91704.84	72289.57	53539.39
HC ppmvd Ref 15% O2	5	4	2	5	4	3	6	6	4
HC, lb/hr	4.75	3.20	1.43	4.75	3.39	1.62	5.72	4.38	2.43
SOX as SO2, lb/hr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Maximim Emissions

NOx ppmvd Ref 15% O2	25	25	25	25	25	25	25	25	25
CO ppmvd Ref 15% O2	132	132	132	128	128	128	120	120	120
VOC ppmvd Ref 15% O2	3.00	3.00	3.00	3.00	3.00	3.00	3.60	3.60	3.00
PM10 lbs/hr	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00

Predicted (P) / Guaranteed Emissions - Stack

NOx ppmvd Ref 15% O2	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5	2.5 / 2.5
NOx as NO2, lb/hr	7.4	5.8	4.3	7.3	5.7	4.2	7.1	5.6	4.1
NH3 Slip ppmvd Ref 15% O2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
CO ppmvd Ref 15% O2	3.7/6.0	3.7/6.0	3.7/6.0	3.4/6.0	3.4/6.0	3.4/6.0	3.0/6.0	3.0/6.0	3.0/6.0
CO, lb/hr	6.6/10.7	5.2/8.4	4.0/6.4	6.1/10.8	4.8/8.4	3.6/6.4	5.2/10.4	4.1/8.2	3.3/6.5
VOC ppmvd Ref 15% O2	1.8 (P)	1.8 (P)	1.7 (P)	1.8 (P)	1.8 (P)	1.7 (P)	2.1 (P)	2.2 (P)	1.7 (P)
VOC, lb/hr	1.9	1.5	1.0	1.8	1.5	1.0	2.1	1.7	1.0

Based on the stated level of SOx (i.e. 0), there should be no particulate contribution from the catalyts.

Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	1.2193	1.2258	1.2315	1.2201	1.2275	1.2336	1.2253	1.2330	1.2394
N2	71.5097	71.8880	72.2192	71.5544	71.9876	72.3426	71.8627	72.3093	72.6817
O2	12.9960	13.8753	14.5619	13.0121	13.9048	14.6051	13.1035	14.0039	14.7278
CO2	6.2762	5.7441	5.3378	6.2745	5.7444	5.3336	6.2747	5.7419	5.3183
H2O	7.9816	7.2522	6.6383	7.9217	7.1206	6.4733	7.5147	6.6947	6.0189
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0134	0.0113	0.0084	0.0136	0.0118	0.0089	0.0153	0.0137	0.0108
HC	0.0003	0.0002	0.0001	0.0003	0.0003	0.0002	0.0004	0.0003	0.0002
NOX	0.0033	0.0030	0.0028	0.0033	0.0030	0.0028	0.0033	0.0030	0.0028

Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.9744	0.9706	0.9677	0.9743	0.9705	0.9676	0.9742	0.9704	0.9674
N2	81.4881	81.1686	80.9264	81.4849	81.1645	80.9192	81.4704	81.1494	80.8976
O2	12.9656	13.7160	14.2859	12.9730	13.7254	14.3026	13.0058	13.7592	14.3517
CO2	4.5526	4.1284	3.8074	4.5483	4.1227	3.7976	4.5282	4.1019	3.7681
H2O	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0153	0.0128	0.0094	0.0154	0.0133	0.0100	0.0173	0.0154	0.0121
HC	0.0006	0.0005	0.0003	0.0006	0.0005	0.0003	0.0008	0.0007	0.0005
NOX	0.0034	0.0030	0.0028	0.0034	0.0030	0.0028	0.0033	0.0030	0.0028

Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.8536	0.8610	0.8674	0.8545	0.8628	0.8697	0.8602	0.8688	0.8761
N2	71.3908	72.0005	72.5359	71.4604	72.1562	72.7300	71.9398	72.6604	73.2651
O2	11.3590	12.1668	12.8048	11.3770	12.2021	12.8551	11.4844	12.3199	12.9976
CO2	3.9885	3.6621	3.4127	3.9888	3.6652	3.4133	3.9985	3.6728	3.4126
H2O	12.3911	11.2951	10.3680	12.3024	11.0987	10.1202	11.6982	10.4610	9.4348
SO2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
CO	0.0134	0.0114	0.0085	0.0135	0.0118	0.0090	0.0153	0.0138	0.0109



TURBINE GEN SET PERFORMANCE
FOR
Edison Mission Energy

GUARANTEED PARAMETERS		JOBSITE LOCATION: TBD, California	
Emissions per Unit with GE Supplied SCR and CO Catalyst <u>100% to 50% Load</u>			
Btu/kW-hr, LHV	AT	UNIT NET KW	NOx EMISSIONS
8290		93189	2.5 PPMVD AT 15 % O2
(kJ/kW-hr, LHV)			CO EMISSIONS
8746			6 PPMVD AT 15 % O2
			PM10 *
			6 lbs/hr (front and back half)
			VOC EMISSIONS *
			2.0 PPMVD AT 15 % O2
			NH3 SLIP
			5 PPMVD AT 15 % O2

GUARANTEE

 John Metcalf
 Date: 09/19/05

NOT VALID WITHOUT STAMP

BASIS OF GUARANTEE:	BASE LOAD, GAS FUEL NOZZLE SYSTEM NO BLEED OR EXTRACTED POWER
ENGINE:	(1) GE LMS100PA GAS TURBINE
FUEL:	20629 Btu/lb / (47983 kJ/kg) LHV, GAS FUEL (#900-1056)
FUEL TEMP:	50°F(28°C) above dew point,@ GE ENERGY BASEPLATE Maximum Fuel Temperature 250°F(121.1°C)
GENERATOR OUTPUT:	13.8 kV, 60 Hz
POWER FACTOR:	≥ .9
AMBIENT TEMP:	90.0°F / (32.2°C)
AMBIENT RH:	37.1 %
INLET CONDITIONING:	EVAP TO 72.8°F / (22.7°C)
ALTITUDE:	1460.0 ft/ (445.0 m)
INLET FILTER LOSS:	≤ 4.50 inH ₂ O/ (114.3 mmH ₂ O)
EXHAUST LOSS:	≤ 12.70 inH ₂ O/ (322.6 mmH ₂ O)
NOX CONTROL:	WATER
INJECTION RATE:	28384 PPH/ (12875 KG/hr) ±20% FLOW
INJECTION TEMP:	100 °F/ (37.8 °C) @ GE ENERGY BASEPLATE
ENGINE CONDITION:	NEW AND CLEAN ≤ 200 SITE FIRED HOURS
FIELD TEST METHODS	
PERFORMANCE:	GE ENERGY SGTGPTM
NOX:	SCAQMD Test Method 100.1
CO:	SCAQMD Test Method 100.1
VOC:	TO 12
PM10:	SCAQMD Test Method 5.1
NH3:	SCAQMD Test Method 207.1

** SI values are for reference purposes only

THIS GUARANTEE SUPERSEDES ANY
 PREVIOUS GUARANTEES PRESENTED



***Conditions for PM10 Emissions Guarantee**

1. Fuel must meet GE specification MID-TD-000-01.
2. The timing of test to coincide with lowest site ambient particulate levels.
3. Gas turbine must run for a minimum of 300 total fired hours at base load prior to testing.
4. Gas turbine inlet and exhaust system must be free of any dirt,sand,mud,rust,oil or any other contaminates.
5. Sampling probe internal surfaces must be made of chemically inert and non-catalytic material such as quartz.
6. The filter material shall be quartz.
7. Probe wash shall be high purity acetone per EPA Method 5.
8. Re-testing (at purchaser's expense) must be allowed, if required.
9. GE receives a copy of the final test results.
10. A compressor wash prior to testing is highly recommended.
11. The area around the turbine is to be treated (e.g.sprayed down with water) to minimize airborne dust.

***Conditions for VOC Emissions Guarantee**

1. Fuel must meet GE specification MID-TD-000-01.
2. The timing of test to coincide with lowest site ambient VOCs levels.
3. Gas turbine must run for a minimum of 300 total fired hours at base load prior to testing.
4. Gas turbine inlet and exhaust system must be free of any dirt,sand,mud,rust,oil or any other contaminates.
5. Re-testing (at purchaser's expense) must be allowed, if required.
6. GE receives a copy of the final test results.
7. A compressor wash prior to testing is highly recommended.



Performance By: Jennifer Woods
Project Info: So Cal Edison

Engine: LMS100 PA
Deck Info: G0179C - 870.scp
Generator: GH155A 60Hz, 13.8kV, 0.9PF (16283)
Fuel: Site Gas Fuel#900-1056, 20829 Btu/lb,LHV

Date: 05/25/2005
Time: 8:56:07 AM
Version: 3.3.1

Case # 100
Ambient Conditions
Dry Bulb, °F 90.0
Wet Bulb, °F 69.8
RH, % 37.1
Altitude, ft 1460.0
Ambient Pressure, psia 13.937

Engine Inlet
Comp Inlet Temp, °F 72.8
RH, % 86.4
Conditioning EVAP
Tons or kBtu/hr 0

Pressure Losses
Inlet Loss, inH2O 4.50
Exhaust Loss, inH2O 12.70

kW, Gen Terms 94362
Est. Btu/kW-hr, LHV 7941
Guar. Btu/kW-hr, LHV 8272
GTG Auxiliary, kW 1173
Fuel Flow
MMBtu/hr, LHV 749.4
lb/hr 36325

Net Package Power and Heat Rate
93189 kW
8042 Btu/kW-hr
8290 Btu/kW-hr

NOx Control Water

Water Injection
lb/hr 28384
Temperature, °F 100.0

Intercooler Water-Air
Humidification OFF
IC Heat Extraction, btu/s 26659
KOD Water Extraction, lb/s 1.4

Control Parameters
HP Speed, RPM 9357
LP Speed, RPM 5273
PT Speed, RPM 3600
PS3 - CDP, psia 525.7
T23 - Inlet Inlet Temp, °F 346.2
P23 - Inlet Inlet Pressure, psia 51.4
W23 - Inlet Inlet Flow, lb/s 417.6
T25 - HPC Inlet Temp, °F 100.0
T3CRF - CDT, °F 721
T48IN, °R 2031
T48IN, °F 1572

Exhaust Parameters
Temperature, °F 796.7
lb/sec 431.9
lb/hr 1554837
Energy, Btu/s- ref 0 °R 141045
Cp, Btu/lb-R 0.2774

Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)
NOx ppmvd Ref 15% O2 26
NOx as NO2, lb/hr 75
CO ppmvd Ref 15% O2 115
CO, lb/hr 211.60
CO2, lb/hr 97621.59
HC ppmvd Ref 15% O2 5
HC, lb/hr 4.96
SOX as SO2, lb/hr 0.00



Performance By: Jennifer Woods
Project Info: So Cal Edison

Engine: LMS100 PA
Deck info: G0179C - 87o.scp
Generator: GH55A 60Hz, 13.8kV, 0.9PF (16283)
Fuel: Site Gas Fuel#900-1056, 20629 Btu/lb, LHV

Date: 05/25/2005
Time: 8:56:07 AM
Version: 3.3.1

Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	1.2194
N2	71.5127
O2	12.9933
CO2	6.2786
H2O	7.9787
SO2	0.0000
CO	0.0136
HC	0.0003
NOX	0.0033

Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.9744
N2	81.4894
O2	12.9625
CO2	4.5542
H2O	0.0000
SO2	0.0000
CO	0.0155
HC	0.0006
NOX	0.0034

Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.8537
N2	71.3954
O2	11.3569
CO2	3.9901
H2O	12.3869
SO2	0.0000
CO	0.0136
HC	0.0006
NOX	0.0029

Aero Energy Fuel Number	son Mission)	Volume %	Weight %
Hydrogen		0.0000	0.0000
Methane		96.1130	91.5453
Ethane		1.8030	3.2188
Ethylene		0.0000	0.0000
Propane		0.3030	0.7933
Propylene		0.0000	0.0000
Butane		0.1030	0.3554
Butylene		0.0000	0.0000
Butadiene		0.0000	0.0000
Perlane		0.0000	0.0000
Cycloperlane		0.0000	0.0000
Hexane		0.0330	0.1688
Heptane		0.0000	0.0000
Carbon Monoxide		0.0000	0.0000
Carbon Dioxide		1.2430	3.2480
Nitrogen		0.4030	0.6703
Water Vapor		0.0000	0.0000
Oxygen		0.0000	0.0000
Hydrogen Sulfide		0.0000	0.0000
Ammonia		0.0000	0.0000
Btu/lb, LHV		20629	
Btu/scf, LHV		918	
Btu/scf, HHV		1018	
Btu/lb, HHV		22871	
Fuel Temp, °F		77.0	
NOx Scalar		0.983	
Specific Gravity		0.58	



Performance By: Jennifer Woods
Project Info: So Cal Edison

Engine: LMS100 PA
Deck Info: G0179C - 870.scp
Generator: GH155A 60Hz, 13.8kV, 0.9PF (16283)
Fuel: Site Gas Fuel#900-1056, 20629 Btu/lb.LHV

Date: 03/25/2005
Time: 8:56:14 AM
Version: 3.3.1

Case #	100	2 PPMVD AT 15 % O2
Ambient Conditions		
Dry Bulb, °C	32.2	
Wet Bulb, °C	21.0	
RH, %	37.1	
Altitude, m	445.0	
Ambient Pressure, kPa	96.094	
Engine Inlet		
Comp Inlet Temp, °C	22.7	
RH, %	86.4	
Conditioning	EVAP	
Tons or kBtu/hr	0	
Pressure Losses		
Inlet Loss, mmH2O	114.30	
Exhaust Loss, mmH2O	322.58	
Net Power and Heat Rate		
kW, Gen Terms	94362	93189
Est. kJ/kWh, LHV	8379	8464
Guar. kJ/kWh, LHV	8728	8746
GTG Auxiliary, kW	1173	
Fuel Flow		
GJ/hr, LHV	790.6	
kg/hr	16477	
NOx Control		
	Water	
Water Injection		
kg/hr	12875	
Temperature, °C	37.8	
Intercooler		
	Water-Air	
Humidification	OFF	
IC Heat Extraction, kJ/s	28126	
KOD Water Extraction, kg/s	0.6	
Control Parameters		
HP Speed, RPM	9357	
LP Speed, RPM	5273	
PT Speed, RPM	3600	
PS3 - CDP, kPa	3624.4	
T23 - Intrl Inlet Temp, °C	174.6	
P23 - Intrl Inlet Pressure, kPa	354.6	
W23 - Intrl Inlet Flow, kg/s	189.4	
T25 - HPC Inlet Temp, °C	37.8	
T3CRF - CDT, °C	383	
T48IN, °R	1129	
T48IN, °C	855	
Exhaust Parameters		
Temperature, °C	424.8	
kg/sec	196.9	
kg/hr	705270	
Energy, J/s-ref 0 °K	148810443	
KJ/kg-R	1.1612	
Emissions (NOT FOR USE IN ENVIRONMENTAL PERMITS)		
NOx mg/Nm3 Ref 15% O2	51	
NOx as NO2, kg/hr	34	
CO mg/Nm3 Ref 15% O2	144	
CO, kg/hr	95.98	
CO2, kg/hr	44280.86	
HC mg/Nm3 Ref 15% O2	3	
HC, kg/hr	2.25	
SOX as SO2, kg/hr	0.00	



Performance By: Jennifer Woods
Project Info: So Cal Edison

Engine: LMS100 PA
Deck Info: G0179C - 87o.scp
Generator: GH155A 80Hz, 13.8kV, 0.9PF (16283)
Fuel: Site Gas Fuel#900-1056, 20629 Btu/lb.LHV

Date: 05/25/2005
Time: 8:56:14 AM
Version: 3.3.1

Exh Wght % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	1.2194
N2	71.5127
O2	12.9933
CO2	6.2786
H2O	7.9787
SO2	0.0000
CO	0.0136
HC	0.0003
NOX	0.0033

Exh Mole % Dry (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.9744
N2	81.4894
O2	12.9625
CO2	4.5542
H2O	0.0000
SO2	0.0000
CO	0.0155
HC	0.0006
NOX	0.0034

Exh Mole % Wet (NOT FOR USE IN ENVIRONMENTAL PERMITS)

AR	0.8537
N2	71.3954
O2	11.3569
CO2	3.9901
H2O	12.3869
SO2	0.0000
CO	0.0136
HC	0.0006
NOX	0.0029

Aero Energy Fuel Number	son Misslon)	Volume %	Weight %
Hydrogen		0.0000	0.0000
Methane		96.1130	91.5453
Ethane		1.8030	3.2188
Ethylene		0.0000	0.0000
Propane		0.3030	0.7933
Propylene		0.0000	0.0000
Butane		0.1030	0.3554
Butylene		0.0000	0.0000
Butadiene		0.0000	0.0000
Pentane		0.0000	0.0000
Cyclopentane		0.0000	0.0000
Hexane		0.0330	0.1688
Heptane		0.0000	0.0000
Carbon Monoxide		0.0000	0.0000
Carbon Dioxide		1.2430	3.2480
Nitrogen		0.4030	0.6703
Water Vapor		0.0000	0.0000
Oxygen		0.0000	0.0000
Hydrogen Sulfide		0.0000	0.0000
Ammonia		0.0000	0.0000
kJ/kg, LHV		47983	
kJ/Nm3, LHV		36051	
kJ/Nm3, HHV		39975	
kJ/kg, HHV		53198	
Fuel Temp, °C		25.0	
NOx Scalar		0.983	
Specific Gravity		0.58	

Edison Mission Energy
Recycle Water Supply and Cooling Water
Air Emissions Modelling Composition Basis

Constituent	Sun Valley Site EMWD RWRP Average Daily Design Basis <u>Concentration as Such</u> (mg/l)	Sun Valley Site Recirculating Cooling Water Composition At 7.4 Cycles of Concentration <u>Concentration as Such</u> (mg/l)
<u>General Parameters</u>		
Alkalinity as CaCO ₃	123	909.7572
Hardness as CaCO ₃	218	1612.4152
Nitrate as NO ₃	31	229.2884
pH (Units)	7.3	7.6
Total Dissolved Solids	676	5000
Total Solids	678	5050
Turbidity	<2 NTU	<100 NTU
<u>Chemical Parameters</u>		
Arsenic	0.0022	0.01627208
Boron	0.48	3.550272
Cadmium	0.00006	0.000443784
Calcium	57.2	423.07408
Chloride	195	1442.298
Chromium, T	0.0047	0.03476308
Copper	0.005	0.036982
Fluoride	0.48	3.550272
Iron	0.1	0.73964
Lead	0.00035	0.00258874
Magnesium	18.3	135.35412
Manganese	0.048	0.3550272
Mercury	0.000047	0.000347631
Nickel	0.0139	0.10280996
Potassium	16.9	124.99916
Silica	22.5	166.419
Silver	0.0006	0.00443784
Sodium	148	1094.6672
Sulfate	143	1057.6852
Zinc	0.14	1.035496

Generator and Fire Pump Engine Emissions

		Emission Factors					Full Load Emissions				
		NOx (g/kW-hr)	SO ₂ ^c (g/kW-hr)	CO (g/kW-hr)	PM (g/kW-hr)	HC (g/kW-hr)	NOx (lb/hr)	SO ₂ (lb/hr)	CO (lb/hr)	PM (lb/hr)	HC (lb/hr)
Generator ^{a,b}	(kW) 1,750	8.3	0.0074	1.2	0.13	0.4	32.02	0.03	4.63	0.50	1.54
Generator	(hp) 2,347	6.19	0.0055	0.89	0.10	0.30	32.02	0.03	4.63	0.50	1.54
Fire Pump ^{d,e} Engine	(hp) 300	5.2	0.0055	0.27	0.09	0.15	3.44	0.004	0.18	0.06	0.10

^a Generator emission factors from CARB certified emissions data for 2005 (engine family number 5CPXL78.1ERK) Executive Order U-R-001-0267

^b Generator engine: Catpillar model 3516B IA, 1750 kW at 1800 RPM (2,347 hp)

^c SO₂ emission factor from Chapter 3, Table 3.4.1 of EPA AP-42, Compilation of Air Pollutant Emission Factors with 15 ppm sulfur (0.0015% S) content in

^d Fire pump engine: Clarke model JW6H-UF40, 300 hp at 2,350 RPM.

^e Emission factors based on vendor information

Standard Diesel Fuel Analysis Data

Parameter	1	2	3	4	5	6	7	8	9	10	Avg.
C %	86.73	87.96	87.84	84.77	86.78	86.8	83.93	84.07	84.64	85.05	85.86
H %	13.01	11.28	11.41	12.72	12.91	12.96	15.55	15.63	15.16	12.9	13.35
O %	.2	.59	.58	2.46	.2	.2	.2	.2	.2	1.68	0.65
N %	.01	.14	.14	.01	.04	.03	.25	.19	.15	.01	0.097
S %	.05	.02	.02	.05	.06	.055	.05	.055	.06	.05	0.047
Ash %	.01	.01	.01	.01	.01	.01	.01	.01	.01	.01	0.01
Btu/lb	19600	20485	20572	19600	19600	19600	19100	19250	19500	19500	19680

Data derived from AB2588 fuel tests for sources in the South Coast AQMD.