

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT SSC DIVISION APPLICATION PROCESSING AND CALCULATIONS	TOTAL PAGES:	PAGE NO.:
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RDO		

PERMIT TO CONSTRUCT/OPERATE

APPLICANT	U.S. GOVT. V.A. MEDICAL CENTER, LONG BEACH
MAILING ADDRESS	5901 EAST 7 TH STREET LONG BEACH, CA 90822
EQUIPMENT LOCATION	SAME

EQUIPMENT DESCRIPTION:

APPLICATION NO 503082

INTERNAL COMBUSTION ENGINE, MTU DETROIT DIESEL, MODEL 6063-HK36, DIESEL FUEL, SIX CYLINDERS, TURBOCHARGED AND AFTERCOOLED, RATED AT 760 B.H.P, DRIVING AN EMERGENCY ELECTRICAL GENERATOR.

APPLICATION NO 510510

TITLE V REVISION

PERMIT CONDITIONS

1. OPERATION OF THIS EQUIPMENT SHALL BE CONDUCTED IN COMPLIANCE WITH ALL DATA AND SPECIFICATIONS SUBMITTED WITH THE APPLICATION UNDER WHICH THIS PERMIT IS ISSUED UNLESS OTHERWISE NOTED BELOW.
2. THIS EQUIPMENT SHALL BE PROPERLY MAINTAINED AND KEPT IN GOOD OPERATING CONDITION AT ALL TIMES.
3. THIS ENGINE SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF RULE 431.2 AND RULE 1470.
4. THIS ENGINE SHALL NOT BE OPERATED MORE THAN 200 HOURS IN ANY ONE YEAR, WHICH INCLUDES NO MORE THAN 50 HOURS IN ANY ONE YEAR FOR MAINTENANCE AND TESTING AND NO MORE THAN 4.2 HOURS IN ANY ONE MONTH FOR MAINTENANCE AND TESTING.
5. OPERATING BEYOND THE 50 HOURS PER YEAR ALLOTTED FOR MAINTENANCE AND TESTING PURPOSES 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

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DISTRIBUTION COMPANY ADVISES THAT A ROTATING OUTAGE IS NO LONGER IMMINENT OR IN EFFECT.

6. AN OPERATIONAL NON-RESETTABLE ELAPSED TIME METER SHALL BE INSTALLED AND MAINTAINED TO INDICATE THE ENGINE ELAPSED OPERATING TIME.
7. AN ENGINE OPERATING LOG SHALL BE KEPT AND MAINTAINED, DOCUMENTING THE TOTAL TIME THE ENGINE IS OPERATED EACH MONTH AND SPECIFIC REASON FOR OPERATION AS:
 - A. EMERGENCY USE.
 - B. MAINTENANCE AND TESTING.
 - C. OTHER (DESCRIBE THE REASON FOR OPERATING).

IN ADDITION, EACH TIME THE ENGINE IS MANUALLY STARTED, THE LOG SHALL INCLUDE THE DATE OF OPERATION, THE SPECIFIC REASON FOR OPERATION, AND THE TOTALIZING HOUR METER READING (IN HOURS AND TENTHS OF HOURS) AT THE BEGINNING AND END OF OPERATION.

8. ON OR BEFORE JANUARY 15TH OF EACH YEAR, THE OPERATOR SHALL RECORD IN THE ENGINE OPERATING LOG THE FOLLOWING:
 - A. THE TOTAL HOURS OF OPERATION FOR THE PREVIOUS CALENDAR YEAR, AND
 - B. THE TOTAL HOURS OF ENGINE OPERATION FOR MAINTENANCE AND TESTING FOR THE PREVIOUS CALENDAR YEAR.

THE ENGINE OPERATING LOG SHALL BE RETAINED ON SITE FOR A MINIMUM OF FIVE CALENDAR YEARS AND SHALL BE MADE AVAILABLE TO THE EXECUTIVE OFFICER OR REPRESENTATIVE UPON REQUEST.

THIS ENGINE SHALL NOT BE USED AS PART OF A DEMAND RESPONSE PROGRAM USING INTERRUPTIBLE SERVICE CONTRACT IN WHICH A FACILITY RECEIVES A PAYMENT OR REDUCED RATES IN RETURN FOR REDUCING ITS ELECTRIC LOAD ON THE GRID WHEN REQUESTED TO SO BY THE UTILITY OR THE GRID OPERATOR.

BACKGROUND:

This application was filed as new construction. The engine will be used as diesel fueled emergency stand-by ICE driving an emergency electrical generator.

In the Facility Permit ID#13990, additions are requested to Section D by the addition of one emergency diesel fueled ICE. Attached is a draft of Section D in the Facility Permit affected by this addition.

This Title V modification is considered as a “de minimis significant revision” to the Title V permit because there is no increase (decrease) of pollutant emissions do not exceed the threshold levels described District Rule 3005 (e)(1) .

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CALCULATIONS

1. Permit processing Emissions calculation methodology

A. Emissions calculations

Determine emissions from NOx, CO, ROG and PM

$$R1(LB / HR) = \frac{hp \times gr / bhp - hr}{454gr / lb}$$

Note R1=R2

Note, PM10 =0.96 PM

Determine emissions from SOX

$$R1(LB / HR) = \frac{EF \times GAL USAGE}{1 \times 10^3}$$

Note R1 = R2

Where EF equal lb/MGAL

Note, if applicant provide SOx in terms of g/bhp-hr, use previous formula

B. Requirements for BACT Rule 1303 (a), Rule 1470 for PM

Item	HP	NOX+VOC	CO	PM10
		G/bhp-hr	G/bhp-hr	G/bhp-hr
BACT		4.8 /	2.6 /	0.15 /
Engine	760	4.54+0.05=4.59/	0.51 /	0.063 /
Compliance		Yes	Yes	yes

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See attached emissions data sheet, certified ICE, ref a/n 452051

2. EMISSIONS CALCULATIONS

	R1-lb/hr	R1-lb/dy	R2-30 dy av	R2-lb/yr
NOx	7.60	7.98	1.06	399
ROG	0.08	0.09	0.01	4.39
CO	0.85	0.90	0.12	45
SOx	0.0082	0.0086	0.00	0.43
PM	0.10546	0.11	0.01	5.54
PM10	0.10124	0.11	0.01	5.32

Certified engine, ref a/n 465048, emissions per AQMD database

3. PERMITTING ACTIVITIES

Rule 3000 (b)(6)-Permitting since the Title V permit was renewed (renewal sent to EPA review July 2010)

The Title V renewal permit was sent to EPA for review, only track increases in emissions increases form a/n 503082 and future applications.

Item	A/n	30 day ave-lb/dy				
		NOx	ROG	CO	SOx	PM10
Em-ICE	503082	+0	+0	+0	+0	+0
Facility totals delta		+0	+0	+0	+0	+0
Threshold limits (lb/dy)		40	30	220	60	30

RULES EVALUATION:

Rule 212 :The engine is not located within 1000 feet of a school, thus public notice is not required.

Rule 401 :The equipment is not expected to emit visible emissions.

Rule 402 :The equipment is not expected to emit odorous emissions.

Rule 404 :Grain loading from the engine expected to comply.

Rule 431.2 Per section (c)(e)(2) require the fuel oil purchased to have a sulfur content of less than 15 ppmw, expected to comply with this Rule.

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Rule 1110.2-Exempt from section (d) per section (h)(2). Add permit condition limiting hours of operation to 200 hours per year.

RULE 1401-Exempt per section (g)(1)(F), does not apply for stand-by generators exempt per Reg 1304

Reg. XIII Compliance with the following sections is anticipated.

1303 (a)-BACT- Emissions meets BACT limit (see table).

1303 (b)(1)-The engines are exempt from modeling for being emergency equipment, per 1304 (a)(4).

1303 (b)(2)- Exempt per Rule 1304 (a)(4) does not apply.

RULE 1470- Compliance with the following sections is anticipated.

1470 (c)(1)-requires ultra low sulfur be used in this equipment 1/2006, but Rule 431.2 already requires the use of this fuel at this time.

1470 (c)(2)(C)(i)(II)-Limit the testing to no more than 50 hours per year

1470 (c)(2)(C)(iv)-Complies, the NOx, CO and VOC complies with the current BACT emissions limits

1470 (d)(9)-Monthly log requirement of this sections as permit conditions.

RULE 1472- The applicant operates engines subject to this Rule and the applicant has a consultant working on submitting a compliance plan and will submit the plan at a later date.

Regulation XXX

This facility (id# 13990) is included in Phase Two of the Title V universe. Therefore the proposed equipment is expected to comply with the following sections:

Rule 3000 (b)(6): The Title V expected permit revision caused by this equipment installation satisfies all the applicable conditions listed in this rule so, it constitutes a de minimus permit revision (see table in evaluation).

Rule 3002: The facility complies with the requirements of this rule by filing for applications in a timely manner and by for the appropriate fees.

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- Rule 3003: The anticipated de minimus permit revision is expected to comply with all the applicable requirements in this rule, of special note are the sections listed below.
- Section (j)(1)(A): The EPA Administrator will timely receive the de minimus permit revision application whenever it becomes available to the Executive Officer.
- Section (j)(1)(B): The EPA Administrator will timely receive the draft of the de minimus permit revision upon completion of District evaluation.
- Section (j)(4): The applicant and the EPA will be timely notified of any refusal to accept all recommendations for the draft permit.
- Rule 3005 (e): Whenever applicable, the procedures for de minimus permit revision stated in this rule will be addressed in a proper and timely manner.

NSPS

Title 40 Part 60 subpart III section 60.4205

Emergency CI ICE of model year of 2007 or later with a displacement of less than 30 liters per cylinder has to comply with the non road emissions standards. The engine displacement is 855 cubic inches and the engine complies with the Tier 2 emission limits, thus compliance with this Regulation is met.

RECOMMENDATIONS

Based on the analysis in this report, the equipment is expected to comply with the applicable Rules and Regulations of the SCAQMD and the applicable BACT requirements.

For this reason, the following disposition is recommended; issue a revised Title V Facility Permit reflecting the addition on one emergency stand-by ICE described under section D.

Updates in Section D and H of the Title V facility Permit resulting from this addition are listed in Equipment and Condition sections of the attached draft permit.

RECOMMENDATIONS

FOR THIS APPLICATION THE FOLLOWING DISPOSITION IS RECOMMENDED:

Issue PC/PO

Engine data entry

Engine hp	760	hp
use default fuel usage	YES	
actual fuel rate	38	gal/hr
fuel rate	38.00	gal/hr
use default E.F.	no	yes/no
use PM default E.F	no	
Use 15 ppm sulfur	yes	yes/no
SOx-15 ppm sulfur	0.21579384	lb/mgal
PM10	0.96	
Nox (actual data)	4.54	g/bhp-hr
ROG (actual data)	0.05	g/bhp-hr
CO (actual data)	0.51	g/bhp-hr
PM (actual data)	0.063	g/bhp-hr
hr/dy	1.05	hr
dy/wk	1	dy
dy/mon	4	dy
wk/yr	50	wk

Emissions Calculations

	R1-lb/hr	R1-lb/dy	R2-30 dy	R2-lb/yr
NOx	/ 7.60	7.98	1.06	399
ROG	/ 0.08	0.09	0.01	4.39
CO	/ 0.85	0.90	0.12	45
SOx	/ 0.0082	0.0086	0.00	0.43
PM	/ 0.10546	0.11	0.01	5.54
PM10	/ 0.10124	0.11	0.01	5.32

lbNOx/hr

$$\begin{aligned}
 &= [\text{E.F., g/bhp-hr}] [\text{Rating, hp}] \\
 &= [4.5 \text{ g/bhp-hr}] [760 \text{ hp}] [1 \text{ lb}/454 \text{ g}] \\
 &= [7.60 \text{ lb/hr}]
 \end{aligned}$$

lbNox/day

$$=[\text{lbNOx/hr}][\text{hr/day}]$$

diesel

$$=[7.60 \text{ lb/hr}][1 \text{ hr/day}]$$

$$=[7.60 \text{ lb/hr}][1 \text{ hr/day}]$$

30 day NOx ave

$$=[\text{lbNox/day}][\text{days/mon}]/[30 \text{ days/mon}]$$

$$=[7.98 \text{ lb/day}][4 \text{ days/mon}]/[30 \text{ days/mon}]$$

$$=[1.06 \text{ lb/day}]$$

lbNox/year

$$=[\text{lbNox/day}][\text{days/wk}][\text{wk/yr}]$$

$$=[7.98 \text{ lb/day}][1 \text{ days/wk}][50 \text{ wk/yr}]$$

$$=[399 \text{ lb/year}]$$

lbCO/hr

$$=[\text{E.F, g/bhp-hr}][\text{Rating, hp}]$$

$$=[0.5 \text{ g/bhp-hr}][760 \text{ hp}][1 \text{ lb}/454 \text{ g}]$$

$$=[0.85 \text{ lb/hr}]$$

lbCO/day

$$=[\text{lbCO/hr}][\text{hr/day}]$$

$$=[0.85 \text{ lb/hr}][1 \text{ hr/day}]$$

$$=[0.90 \text{ lb/day}]$$

30 day CO ave

$$=[\text{lbCO/hr}][\text{hr/day}]$$

$$=[0.12 \text{ lb/day}][4 \text{ days/mon}]/[30 \text{ days/mon}]$$

$$=[0.12 \text{ lb/day}]$$

lbCO/year

$$=[\text{lbCO/day}][\text{days/wk}][\text{wk/yr}]$$

$$=[0.90 \text{ lb/day}][1 \text{ days/wk}][50 \text{ wk/yr}]$$

$$=[45 \text{ lb/year}]$$

lbROG/hr

$$[\text{E.F, g/bhp-hr}][\text{Rating, hp}]$$

$$[0.05 \text{ g/bhp-hr}][760 \text{ hp}][1 \text{ lb}/454 \text{ g}]$$

$$[0.08 \text{ lb/hr}]$$

lbROG/day

$$[\text{lbROG/hr}][\text{hr/day}]$$

$$[0.09 \text{ lb/hr}][1 \text{ hr/day}]$$

$$[0.09 \text{ lb/day}]$$

30 day ROG ave

$$[\text{lbROG/day}][\text{days/mon}]/[30 \text{ days/mon}]$$

[0.01 lb/day][4days/mon]/[30 days/mon]
[0.01 lb/day] diesel

lbROG/year

[lbROG/day][days/wk][wk/yr]
[0.01 lb/day][1days/wk][50wk/yr]
[4 lb/year]

lbSOx/hr

[SOx E.F.][gal/hr][Fuel rate]
[0.22 lb/mgal][38.00 gal/hr][1mgal/1000 gal]
[0.0082 lb/hr]

lbSOx/day

[lbSOx/hr] x [hr/day]
[0.0082 lb/hr] x [1 hr/day]
[0.0086 lb/day]

30 day SOx ave

[lbSOx/day][days/mon]/[30 days/mon]
[0.0011 lb/day][4days/mon]/[30 days/mon]
[0.0011 lb/day]

lbSOx/year

[lbSOx/day][days/wk][wk/yr]
[0.0011 lb/day][1days/wk][50wk/yr]
[0 lb/year]

lbPM/hr

[E.F, g/bhp-hr][Rating, hp]
[0.06 g/bhp-hr][760 hp][1 lb/454 g]
[0.105 lb/hr]

lbPM/day

[lbPM/hr][hr/day]
[0.1055 lb/hr] [1 hr/day]
[0.1107 lb/day]

30 day PM ave

[lbPM/day][days/mon]/[30 days/mon]
[0.1107 lb/day][4days/mon]/[30 days/mon]
[0.0148 lb/day]

lbPM/year

[lbPM/day][days/wk][wk/yr]
[0.1107 lb/day][1days/wk][50wk/yr]
[5.54 lb/year]

lbPM10/hr

diesel

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[PM lb/hr][0.96]

[0.1055 lb/hr] [0.96]

[0.101 lb/hr]

lbPM10/dy

[PM lb/dy][0.96]

[0.1107 lb/day] [0.96]

[0.106 lb/day]

30 day ave PM10 lb/dy

[PM 30 dy ave][0.96]

[0.1107 lb/day] [0.96]

[0.106 lb/day]

lbPM10/yr

[PM lb/yr][0.96]

[5.5368 lb/yr] [0.96]

[5.315 lb/yr]

Equations

A. Emissions as a function of lb/mgal or g/bhp-hr

Emissions = E.F. (lb/mgal) * gal/hr * 1mgal/1000 gal

Emissions = gr/hp-hr *hp * 1lb/454 gr

B. NSR 30 day and lb/yr values

30 day ave = lb/hr * hr/dy * dy/mon * (1mon/30 day)

lb/yr = lb/hr * hr/dy * dy/wk * wk/yr