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DEPARTMENT OF
ENVIRONMENTAL QUALITY



February 7, 2014

Mr. Scott Porter
Environmental Quality Manager
Pima County Department of Environmental Quality
33 N. Stone Ave., Suite 700
Tucson, AZ 85701

Re: Request for Minor Air Quality Permit Revision
ASARCO LLC—Mission Complex, Permit No. 2026

Dear Mr. Porter:

ASARCO LLC (“Asarco”) Mission Complex currently operates three emergency stationary compression ignition engines (CI ICE), MMEME-GEN-AD, MMEME- GEN-TH, and MMEME-GEN-DSP at the Administration Building, North Mill Thickener and Mission Pit Dispatch Shack. Each emergency CI ICE is regulated as a new source under NSPS Subpart III. Each CI ICE can be operated for unlimited hours during emergencies, and each is otherwise limited to 100-hours of operation each year for maintenance checks and readiness testing.¹ Asarco plans to change the status of these emergency stationary engines to non-emergency and limit the operation of each CI ICE to no more than 500 hours per year. Because each CI ICE is currently certified to meet Tier 3 emission limits, Asarco is in compliance with emission standards for non-emergency engines. *See* 40 C.F.R. §§ 60.4211(c), 60.4204(b), 60.4201(a). NSPS Subpart III requires no additional requirements for testing, reporting or recordkeeping as a result of changing CI ICE MMEME-GEN AD, TH and DSP from emergency to non-emergency operation.

Asarco also requests a change to Permit Condition Part B, Section 5.III.B, “Visible Emission Check.” Asarco does not operate these engines at any scheduled frequency, does not consistently run the engines each quarter, and often the engines are operated at night when it is impossible to conduct a visible emission check. In lieu of quarterly Method 22 visual

¹ Permit Condition Part B, Section 5, II.E. *See also* 40 C.F.R. § 60.4211(f). This provision also allows Asarco to operate the emergency stationary generator “up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing.”

observations while these engines are operating, Asarco proposes to conduct annual Method 9 observations for MMEME-GEN-AD, MMEME-GEN-TH and MMEME-GEN-DSP. Asarco Environmental Department can thus control and schedule the visible observation checks of these engines and better ensure compliance with this requirement.

Asarco believes that the proposed change in status of these stationary generators qualifies for a minor permit revision for the following reasons:

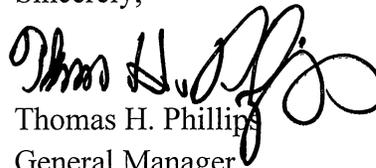
- Change in status of the current generators does not violate any applicable requirement;
- Change in status of the current generators does not require any substantive change to existing monitoring, reporting or recordkeeping requirements in the permit.
- Change in status of the current generators does not require or change a case-by-case determination of an emission limitation, other standard, or a source-specific determination of ambient impacts or visibility.
- Change in status of the current generators does not alter an emissions cap or federal alternative emissions limit. Instead, the unit will comply with existing NSPS limits.
- The change is not a modification under any provision of Title I. The amount of emissions increase is well below PSD “significant” thresholds, as demonstrated in the attached application materials.
- The generators will continue to burn the same fuel.
- Change in status of the current generators will not cause a “significant” increase in air emissions.
- The proposed change in status of the generators is not required to be processed as a “significant” permit revision by PCC 17.12.260.

PCC 17.12.255.A. Asarco therefore believes that a minor permit revision satisfies both the Pima County Code and Pima County SIP provisions and requests that PDEQ issue the requested permit revision as soon as possible.

Asarco requests that minor permit processing procedures be used on this application. A copy of the standard permit application form and supporting emissions calculations is attached. Please contact Jamie Ekholm at 520-393-4671 if you have any questions or concerns.

I certify that the proposed revision meets the criteria for use of minor permit revision procedures and that the information contained in this document and all attachments is true, accurate, and complete to the best of my knowledge after reasonable inquiry of those who prepare them.

Sincerely,



Thomas H. Phillips
General Manager

Attachments:

- A – Standard Permit Application
- B – Emissions Calculations
- C – Additional Information
- D – Site Map
- E – Manufacturer's Specifications

ATTACHMENT "A"
Standard Permit Application

PIMA COUNTY DEPARTMENT OF ENVIRONMENTAL QUALITY
Air Program
33 N. Stone Avenue • Suite 700 • Tucson, AZ 85701 • Phone: (520) 243-7400

STANDARD PERMIT APPLICATION FORM FOR CLASS I SOURCES

(As required by A.R.S. § 49-480, and Title 17 of the Pima County Code)

1. Permit to be issued to (Arizona Corporate Commission Registered Name): ASARCO LLC

2. Mailing Address: 4201 West Pima Mine Road
City: Sahuarita State: AZ ZIP: 85629

3. Plant Name (if different than item #1): Mission Complex

4. Name (or names) of Owner or Operator: ASARCO LLC
FAX #: (520) 648-0802 Phone: (520) 648-2500
Email: NA

5. Name of Owner's Agent: Thomas H. Phillips
FAX #: (520) 625-9632 Phone: (520) 648-4528

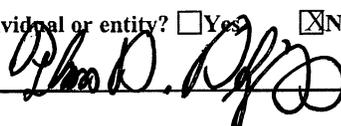
6. Plant/Site Manager/Contact Person: Jamie Ekholm
FAX #: (520) 648-0802 Phone: (520) 393-4671
Email: jekholm@asarco.com

7. Proposed Equipment/Plant Location Address: Same as above
City: _____ State: _____ ZIP: _____
Indian Reservation (if applicable): NA T/R/S, Lat/Long, Elev: 31 59' 50.35"N/111 02'58.95" W, 3123 ft

8. General Nature of Business: Mining
Standard Industrial Classification Code: 1021 State Permit Class: Title V, Class I

9. Type of Organization: Corporation Individual Owner Partnership Government Entity Other LLC

10. Permit Application Basis (Check all that apply): New Source General Permit
 Renewal Revision: Administrative Minor Significant Existing Permit # _____
Date of Commencement of Construction or Modification: Once approved
Is any of the equipment to be leased to another individual or entity? Yes No

11. Signature of Responsible Official of Organization: 
Official Title of Signer: General Manager

12. Typed or Printed Name & E-mail of Signer: Thomas H. Phillips
Date: 2-7-14 Telephone Number: (520) 648-4528

EMISSION SOURCES

COMPANY NAME: ASARCO LLC

PAGE 1 OF 2
DATE February 2014

Estimated "Potential to Emit" per 17.04.340.A.164.
Review of applications and issuance of permits will be expedited by supplying all necessary information on this Table.

REGULATED AIR POLLUTANT DATA			EMISSION POINT DISCHARGE PARAMETERS											
NUMBER	EMISSION POINT [1]	CHEMICAL COMPOSITION OF TOTAL STREAM	REG. AIR POLLUTANT EMISSION RATE		UTM COORDINATES OF EMISSION POINT			STACK SOURCES [6]			NONPOINT			
			#/ HR. [3]	TONS/ YEAR [4]	ZONE	EAST (Mtrs)	NORTH (Mtrs)	HEIGHT ABOVE GROUND (ft)	HEIGHT ABOVE STRUC. (ft)	DIA. (ft)	VEL (fps)	TEMP. (°F)	LENGTH (ft)	WIDTH (ft)
	MME-ME-GEN-TH	PM	.04	.01	12	495295	3540240	7	NA	NA	1020	NA	NA	NA
		CO	.12	.03	12			7	NA	NA	1020			
		NOx	.56	.14	12			7	NA	NA	1020			
	MME-ME-GEN-AD	PM	.04	.01	12	495417	3540259	7	NA	NA	1020	NA	NA	NA
		CO	.12	.03	12			7	NA	NA	1020			
		NOx	.56	.14	12			7	NA	NA	1020			

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 3123 feet. PDEQ STANDARD CONDITIONS ARE 293K AND 101.3 KILOPASCALS (17.04.340.A.210)

General Instructions:

- Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.
- Components to be listed include regulated air pollutants as defined in 17.04.340.A.182. Examples of typical component names are: Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Sulfur Dioxide (SO₂), Volatile Organic Compounds (VOC), particulate matter (PM), particulate less than 10 microns (PM₁₀), etc. Abbreviations are O.K.
- Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.
- Tons per year is annual maximum potential emission expected by applicant, which takes into account process operating schedule.
- As a minimum applicant shall furnish a facility plot plan as described in the filing instructions. UTM coordinates are required only if the source is a major source or is required to perform refined modeling for the purposes of demonstrating compliance with ambient air quality guidelines.
- Supply additional information as follows if appropriate:
 - Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
 - Stack's height above supporting or adjacent structures if structure is within 3 times the "stack height above the ground" of stack.
- Dimensions of nonpoint sources as defined in 17.04.34.A.147.

EMISSION SOURCES

COMPANY NAME: ASARCO LLC

PAGE 2 OF 2
DATE February 2014

Estimated "Potential to Emit" per 17.04.340.A.164.
Review of applications and issuance of permits will be expedited by supplying all necessary information on this Table.

EMISSION POINT NUMBER	REGULATED AIR POLLUTANT DATA		EMISSION POINT DISCHARGE PARAMETERS							NONPOINT SOURCES				
	EMISSION POINT [1]	CHEMICAL COMPOSITION OF TOTAL STREAM	REG. AIR POLLUTANT EMISSION RATE	UTM COORDINATES OF EMISSION POINT [5]			STACK SOURCES [6]				NONPOINT SOURCES [7]			
	NAME	REGULATED AIR POLLUTANT NAME [2]	#/HR [3]	TONS/YEAR [4]	ZONE	EAST (Mtrs)	NORTH (Mtrs)	HEIGHT ABOVE GROUND (ft)	HEIGHT ABOVE STRUC. (ft)	DIA. (ft)	VEL (fps)	TEMP. (°F)	LENGTH (ft)	WIDTH (ft)
	MMEME-GEN-DSP	PM	.04	.009	12	494683	3540029	7	NA	NA	NA	1020	NA	NA
		CO	.16	.04	12			7	NA	NA	NA	1020		
		NOx	.56	.14	12			7	NA	NA	NA	1020		

GROUND ELEVATION OF FACILITY ABOVE MEAN SEA LEVEL 3123 feet. PDEQ STANDARD CONDITIONS ARE 293K AND 101.3 KILOPASCALS (17.04.340.A.210)

General Instructions:

- Identify each emission point with a unique number for this plant site, consistent with emission point identification used on plot plan, previous permits, and Emissions Inventory Questionnaire. Include fugitive emissions. Limit emission point number to eight (8) character spaces. For each emission point use as many lines as necessary to list regulated air pollutant data. Typical emission point names are: heater, vent, boiler, tank, reactor, separator, baghouse, fugitive, etc. Abbreviations are O.K.
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- Pounds per hour (#/HR) is maximum potential emission rate expected by applicant.
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- Supply additional information as follows if appropriate:
 - Stack exit configuration other than a round vertical stack. Show length and width for a rectangular stack. Indicate if horizontal discharge with a note.
 - Stack's height above supporting or adjacent structures if structure is within 3 times the "stack height above the ground" of stack.
- Dimensions of nonpoint sources as defined in 17.04.34.A.147.

Certification of Compliance with all Applicable Requirements

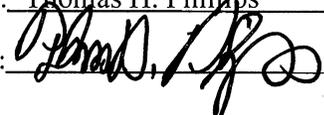
Permit Number (If existing source) 2026

This certification must be signed by a Responsible Official. Applications without a signed certification will be deemed incomplete.

The responsible official is defined as a person who is in charge of principal business functions or who performs policy or decision making functions for the business. This may also include an authorized representative for such persons. For a complete definition, see Pima County Air Quality Control, Title 17, Section 17.04.340(A)(186).

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by the Pima County Department of Environmental Quality (PDEQ) as public record. I also attest that I am in compliance with the applicable requirements and will continue to comply with such requirements and any future requirements that become effective during the life of my permit. I will present a certification of compliance to PDEQ no less than annually and more frequently if specified by PDEQ. I further state that I will assume responsibility for the construction, modification, or operation of the source in accordance with the requirements of Title 17 of the Pima County Code and any permit issued thereof.

Name (Print/Type): Thomas H. Phillips Title: General Manager

(Signature):  Date: 2-7-14

Certification of Truth, Accuracy, and Completeness

17.12.160(H) - Certification of Truth, Accuracy, and Completeness. Any application form, report, or compliance certification submitted pursuant to this Chapter shall contain certification by a responsible official of truth, accuracy, and completeness. This certification shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the documents are true, accurate, and complete.

By my signature I, (Name) Thomas H. Phillips, hereby certify that based on information and belief formed after reasonable inquiry, the statements and information in this document are true, accurate, and complete.

Signature of Responsible Official of Organization: 

Title: General Manager Date: 2-7-14

**Pima County Department of Environmental Quality
Air Quality Permit Fees – Revised November 2012
*Fees adjusted annually using Consumer Price Index (CPI) per PCC 17.12.510.F***

Class I Sources – Individual Permit

<u>Annual Administrative Fees:</u>	<u>Annual Emission-Based Fee:</u>
Aerospace	\$17,340.00
Cement Plant	\$53,100.00
Combustion/Boiler	\$12,910.00
Compressor Station	\$10,610.00
Copper or Nickel Mine	\$12,490.00
Copper Smelter	\$53,100.00
Electronics	\$17,080.00
Expandable Foam	\$12,240.00
Foundry	\$16,270.00
Gold Mine	\$12,490.00
Landfill	\$13,300.00
Lime Plant	\$49,730.00
Mobile Home Manufacturing	\$12,370.00
Other	\$13,300.00
Other with Continuous Emissions	
Monitoring	\$17,080.00
Paper Coater	\$12,910.00
Paper Mill	\$17,070.00
Petroleum Products Terminal Facility	\$18,950.00
Polymeric Fabric Coater	\$17,070.00
Reinforced Plastics	\$12,910.00
Semiconductor Fabrication	\$22,460.00
Utility: Fossil Fuel Except Natural Gas	\$27,150.00
Utility: Natural Gas	\$13,710.00
Vitamin/Pharmaceutical Manufacturing	\$13,170.00
Wood Furniture	\$12,910.00

\$15.79
per ton, per pollutant, for
all regulated pollutants

Permit Processing Fee:

\$117.80 per hour

Accelerated Permit Application Fee:

\$15,000.00

**ATTACHMENT “B”
Emissions Calculations**

Emissions Calculations for Generators MM-GEN-TH and MM-GEN-AD

The 63 kW stationary generators meet the Tier III emission standards of 40 C.F.R. § 89.112. The engine manufacturer (Perkins) has provided the following emissions specifications for these units:

Emissions	g/kW-hr
NO _x +NMHC	4.42
NO _x ¹	3.97
PM	0.28
CO	1.02

Asarco calculated potential emissions using 100 hours in its initial permit application based on the allowable “maintenance and readiness testing” hours because the amount of time the generators would likely be operated during an “emergency” could not be estimated.

In support of its modification to non-emergency CI ICE, Asarco provides the following calculations demonstrating that its requested 500 hour limit results in insignificant emissions from each generator (emissions below are from each 60 kW generator).

	NO _x +NMHC (lbs)	NO _x (lbs)	PM (lbs)	CO (lbs)
g/kW-hr ¹	4.42	3.97	0.28	1.02
100 hrs	61.3	55.1	3.9	14.2
500 hrs	306.7	275.5	19.4	70.8

¹ **NOTE:** There is no NO_x emission standard for this Tier III engine per 40 C.F.R. § 89.112, Table 1. Therefore, the engine manufacturer, Perkins, has not provided a NO_x emissions factor for this engine. The gen set manufacturer, CAT, has provided a NO_x emissions factor for this gen set of 5.40 g/hp-hr for informational purposes only. Asarco is relying on this “informational” value to calculate NO_x potential emissions for purposes of this application.

Emission Calculation for MM-GEN-DSP

The 40 kW stationary generator meets the Tier III emission standards of 40 C.F.R. § 89.112. The engine manufacturer (CAT) has provided the following emissions specifications for this unit:

Emissions	g/kW-hr
NO _x +NMHC	4.42
NO _x ¹	3.97
PM	0.26
CO	1.02

Asarco calculated potential emissions using 100 hours in its initial permit application based on the allowable “maintenance and readiness testing” hours because the amount of time the generators would likely be operated during an “emergency” could not be estimated.

In support of its modification to non-emergency CI ICE, Asarco provides the following calculations demonstrating that its requested 500 hour limit results in insignificant emissions from MEME-GEN-DSP.

	NO _x +NMHC (lbs)	NO _x (lbs)	PM (lbs)	CO (lbs)
g/kW-hr ¹	4.42	3.97	0.26	1.02
100 hrs	61.3	55.1	3.6	14.2
500 hrs	306.7	275.5	18.0	70.8

¹ **NOTE:** There is no NO_x emission standard for this Tier III engine per 40 C.F.R. § 89.112, Table 1. The gen set manufacturer, CAT, has provided a NO_x emissions factor for this gen set of 5.40 g/hp-hr for informational purposes only. Asarco is relying on this “informational” value to calculate NO_x potential emissions for purposes of this application.

ATTACHMENT "C"

Additional Information

1. Description of the process to be carried out by each unit.

Each CI ICE was initially permitted as an "emergency generator" with operations limited to "emergency situations" (as defined by 40 C.F.R. § 60.4219 [emergency stationary combustion engine]) which included up to 100 hours per year for maintenance checks and readiness testing and also allowed for "up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing." 40 C.F.R. § 4211(f). There was no limit on the number of hours each emergency generator could be operated during emergency situations. 40 C.F.R. § 4211(f)(1).

Asarco is proposing to change the status of these CI ICE from emergency to non-emergency. Because the requirements for owners and operators of new (2007 model and later) emergency engines and non-emergency engines are the same, the certified Tier III engines purchased to satisfy 40 CFR 40 C.F.R. § 4205(b) emergency engine requirements also satisfy 40 C.F.R. § 4204(b) non-emergency engine requirements (see 40 CFR § 4211(c)).

As indicated in #8 below, are no additional applicable requirements under NSPS Subpart IIII that otherwise apply to the non-emergency engines. Asarco is proposing to limit operation of each of these engines to 500-hours per year, including both emergency and non-emergency operation. Hour meters installed to demonstrate compliance with the maintenance and readiness operation limitations under emergency status will be used to track total hours operated.

2. Description of raw materials, intermediates and products.

The generators will continue to combust diesel fuel to produce electrical energy. Diesel fuel used will have a sulfur content less than 0.90 percent by weight as required by Pima County Code and 40 C.F.R. §§ 60.4207(b) and 80.510(b).

3. Not Applicable

4. Not Applicable

5. Not Applicable

6. Not Applicable

7. Emissions Related Information

See Attachment "B".

8. Citation and description of all applicable requirements as defined in 17.04.340.A.25.

Federal New Source Performance Standard 40 C.F.R. Part 60, Subpart IIII is applicable to this emergency generator. The following provisions of Subpart IIII apply:

40 C.F.R. § 60.4200(a) – Applicability

40 C.F.R. § 60.4201(a) – Engine Certification; this “manufacturer” provision applies to owners/operators via 40 C.F.R. § 60.4204(b).

40 C.F.R. § 60.4204(b) – Emission standards

40 C.F.R. § 60.4206 – Emission standard compliance duration

40 C.F.R. § 60.4207(b) – Fuel requirements

40 C.F.R. § 60.4208(a) – Engine manufacturing prohibition

40 C.F.R. § 60.4211(a) – Operational requirements

40 C.F.R. § 60.4211(c) – Engine emission standard (Tier III) certification requirement

40 C.F.R. § 60.4211(g) – Operation of generator not according to manufacturer’s written specifications

9. Not Applicable

10. Not Applicable

11. Not Applicable

12. Stack Information

There are no physical changes to these generators.

13. Site Diagram

Attached as Attachment “D”.

14. Air Pollution Control Equipment

No compliance testing is required for these non-emergency generators pursuant to 40 C.F.R. § 60.4211(d).

15. Not Applicable

16. Compliance Plan and Schedule

The generators will continue to meet all applicable regulations.

17. Compliance certification

ASARCO Mission Complex's responsible corporate official has certified this application as required.

18. Not Applicable

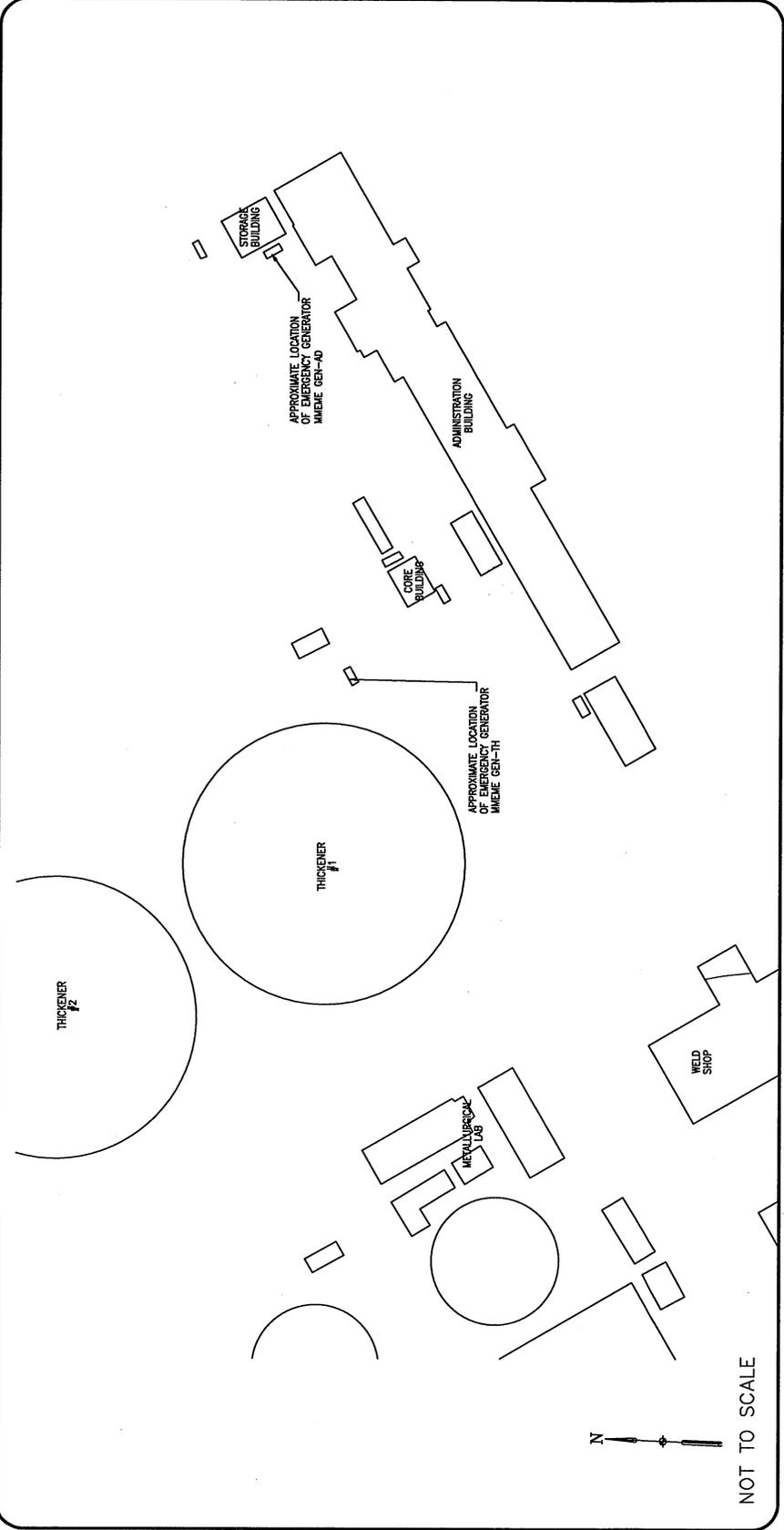
19. New major source or major modification requirements

Based on ASARCO's emission calculations contained in Attachment "B," the proposed change in status of these generators does not trigger PSD review because the total emissions of the project are less than 10 tons/year.

20. Calculations on which all information requested in this application are based

See Attachment "B".

ATTACHMENT "D"
Site Map

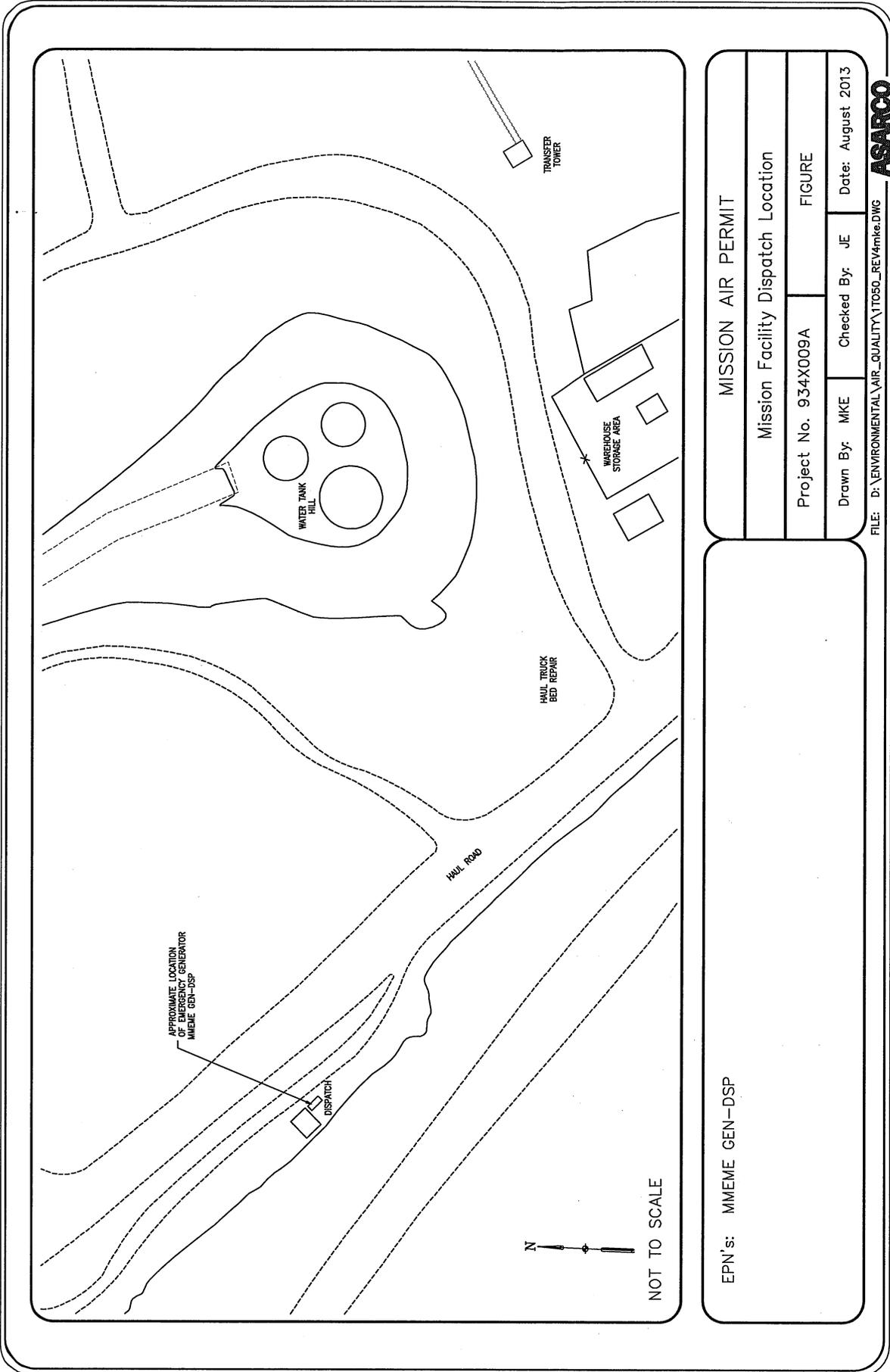


MISSION AIR PERMIT	
Mission Facility Building Locations	
Project No. 934X009A	FIGURE
Drawn By: MKE	Checked By: JE
Date: May 2013	

FILE: D:\ENVIRONMENTAL\AIR_QUALITY\1T050_REV3mke.DWG



EPN's: MMEME GEN-AD MMEME GEN-TH



EPN's: MMEME GEN-DSP

MISSION AIR PERMIT

Mission Facility Dispatch Location

Project No. 934X009A

FIGURE

Drawn By: MKE Checked By: JE

Date: August 2013

FILE: D:\ENVIRONMENTAL\AIR_QUALITY\17050_REV4\mke.dwg

ASARCO
MISSION COMPLEX

ATTACHMENT "E"
Manufacturer's Specifications



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2012 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT OF 1990

OFFICE OF TRANSPORTATION
AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: Perkins Engines Co Ltd
(U.S. Manufacturer or Importer)

Certificate Number: CPKXL04.4NH1-006

Effective Date:
09/02/2011

Expiration Date:
12/31/2012


Karl J. Simon, Director
Compliance and Innovative Strategies Division

Issue Date:
09/02/2011
Revision Date:
N/A

Model Year: 2012

Manufacturer Type: Original Engine Manufacturer

Engine Family: CPKXL04.4NH1

Mobile/Stationary Indicator: Stationary
Emissions Power Category: 56<=kW<75
Fuel Type: Non-Standard Fuel, Diesel
After Treatment Devices: No After Treatment Devices Installed
Non-after Treatment Devices: Electronic Control

Pursuant to Section 111 and Section 213 of the Clean Air Act (42 U.S.C. sections 7411 and 7547) and 40 CFR Part 60, and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following engines, by engine family, more fully described in the documentation required by 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new compression-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 60.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 60.

This certificate does not cover engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.



1100D Series Diesel Engine Emissions
Standby Power Rated @ 1800rpm

Limits EPA 40 CRF Part 89 Tier 3	PM g/kWh	CO g/kWh	NOx + NMHC g/kWh
Class of the engine 75-kW<130	0.3	5.0	4.7
Class of the engine 130<KW<225	0.2	3.5	4.0

Engine Type	Standby Power kW	EPA Emissions Level	PM g/kWh	CO g/kWh	NOx + NMHC g/kWh	Comments
1104D-44TG1	63	Tier 3	0.283	1.02	4.42	
1104D-E44TG1	71.5	Tier 3	0.187	1.20	4.22	
1104D-E44TAG1	90.8	Tier 3	0.151	1.31	3.56	
1104D-E44TAG2	111.0	Tier 3	0.183	1.46	3.72	
1106D-E66TAG2	153.6	Tier 3	0.157	0.81	3.71	
1106D-E66TAG3	163.3	Tier 3	0.156	0.78	3.73	
1106D-E66TAG4	192.3	Tier 3	0.146	1.06	3.81	

Typical emissions levels for 1100D Series diesel engines. Data may be subject to variation if the engine is not maintained according to Perkins Service and Maintenance Manuals. Data is valid on date of issue only.

STANDBY 60 ekW 75 kVA
60 Hz 1800 rpm 480 Volts



SPECIFICATIONS

CAT GENERATOR

Frame Size.....LC2014H
Excitation.....Self Excited
Pitch..... 0.6667
Number of Poles..... 4
Number of bearings..... Single Bearing
Number of Leads..... 012
IP Rating..... IP23
Overspeed capability..... 125
Wave form deviation (Line Wave Form to Line)..... 002.00
Paralleling kit droop transformer..... Standard
Voltage regulator.3 Phase sensing with selectable volts/Hz
Telephone Influence Factor..... Less than 50

CAT ENGINE

C4.4 In-line 4, 4-cycle diesel
Bore - mm..... 105.00 mm (4.13 in)
Stroke - mm..... 127.00 mm (5.0 in)
Displacement-L..... 4.40 L (268.5 in³)
Compression ratio..... 16.2:1
Aspiration..... T
Fuel system..... Common Rail
Governor type..... Mechanical

Emissions (Nominal)

NOx g/hp-hr..... 5.40
CO g/hp-hr..... 1.69
HC g/hp-hr..... .32
PM g/hp-hr..... .28

Control Panel

Heavy duty sheet steel enclosure with lockable hinged door
Vibration isolated from generating set
LCD display
AC metering
DC metering
Fail to start shutdown
Low oil pressure shutdown
High engine temperature
Low / high battery voltage
Underspeed/overspeed
Loss of engine speed detection
2 spare fault channels
20 event fault log
2 LED status indicators
Lockdown emergency stop push button

STANDBY 60 ekW 75 kVA
60 Hz 1800 rpm 480 Volts



TECHNICAL DATA

Open Generator Set - - 1800 rpm/60 Hz/480 Volts	PM3468	
Tier 3		
Generator Set Package Performance Genset Power rating @ 0.8 pf Genset Power rating with fan	75 kVA 60 ekW	
Fuel Consumption 100% load with fan	20.0 L/hr	5.3 Gal/hr
Cooling System ¹ Air flow restriction (system) Air flow (max @ rated speed for radiator arrangement) Engine Coolant capacity with radiator/exp. tank Engine coolant capacity Radiator coolant capacity	0.12 kPa m ³ /min 6.7 L .7 L 6.0 L	0.48 in. water 1.8 gal 0.2 gal 1.6 gal
Inlet Air Combustion air inlet flow rate	6.0 m ³ /min	211.9 cfm
Exhaust System Exhaust stack gas temperature Exhaust gas flow rate Exhaust flange size (internal diameter)	550.0 ° C 15.1 m ³ /min 6.4 mm	1022.0 ° F 533.3 cfm 0.3 in
Heat Rejection Heat rejection to coolant (total) Heat rejection to exhaust (total) Heat rejection to atmosphere from generator	50 kW 68 kW 6.1 kW	2843 Btu/min 3867 Btu/min 346.9 Btu/min
Alternator² Motor starting capability @ 30% voltage dip Frame Temperature Rise	163 skVA LC2014H 105 ° C	189 ° F

¹ For ambient and altitude capabilities consult your Caterpillar dealer. Airflow restriction (system) is added to existing restriction from factory.

² Generator temperature rise is based on a 40 C (104 F) ambient per NEMA MG1-32.

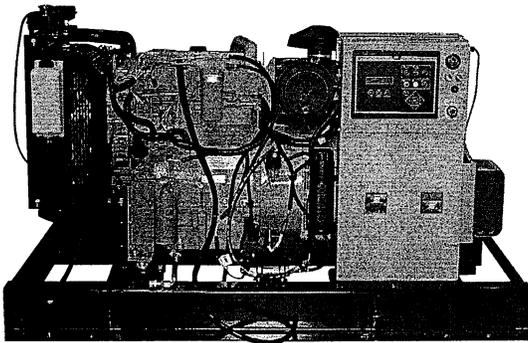


Image shown may not reflect actual package.

STANDBY
40 ekW 50 kVA

PRIME
36 ekW 45 kVA
60 Hz 1800 rpm 480 Volts

Caterpillar is leading the power generation marketplace with Power Solutions engineered to deliver unmatched flexibility, expandability, reliability, and cost-effectiveness.

FEATURES

FUEL/EMISSIONS STRATEGY

- EPA Certified for Stationary Emergency Application (EPA Tier 3 emissions levels)

FULL RANGE OF ATTACHMENTS

- Wide range of bolt-on system expansion attachments, factory designed and tested
- Flexible packaging options for easy and cost effective installation

SINGLE-SOURCE SUPPLIER

- Fully prototype tested with certified torsional vibration analysis available

WORLDWIDE PRODUCT SUPPORT

- Cat dealers provide extensive post sale support including maintenance and repair agreements
- Cat dealers have over 1,800 dealer branch stores operating in 200 countries
- The Cat® S•O•SSM program cost effectively detects internal engine component condition, even the presence of unwanted fluids and combustion by-products

Cat Model D40-6, Three Phase

CAT® C4.4 DIESEL ENGINE

- Reliable, rugged, durable design
- Field-proven in thousands of applications worldwide
- Four-stroke diesel engine combines consistent performance and excellent fuel economy with minimum weight
- Electronic engine control

GENERATOR SET

- Complete system designed and built at ISO 9001 certified facilities
- Factory tested to design specifications at full load conditions

CAT EMCP 4 CONTROL PANELS

- Simple user friendly interface and navigation
- Scalable system to meet a wide range of customer needs
- Integrated Control System and Communications Gateway

SEISMIC CERTIFICATION

- Seismic Certification available
- Anchoring details are site specific, and are dependent on many factors such as generator set size, weight, and concrete strength. IBC Certification requires that the anchoring system used is reviewed and approved by a Professional Engineer
- Seismic Certification per Applicable Building codes: IBC 2000, IBC 2003, IBC 2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010
- Pre-approved by OSHPD and carries an OSP-0321-10 for use in healthcare projects in California

STANDBY 40 ekW 50 kVA
PRIME 36 ekW 45 kVA
 60 Hz 1800 rpm 480 Volts



FACTORY INSTALLED STANDARD & OPTIONAL EQUIPMENT

System	Standard	Optional
Air Inlet	<ul style="list-style-type: none"> • Dry replaceable paper element type with restriction indicator 	
Cooling	<ul style="list-style-type: none"> • Radiator and cooling fan complete with protective guards • Standard ambient temperatures up to 50°C (122°F) 	<input type="checkbox"/> Radiator stone guard <input type="checkbox"/> Radiator transition flange
Exhaust		<input type="checkbox"/> Industrial <input type="checkbox"/> Residential <input type="checkbox"/> Critical mufflers <input type="checkbox"/> Overhead silencer mounting kit
Fuel	<ul style="list-style-type: none"> • Flexible fuel lines to base with NPT connections 	<input type="checkbox"/> Sub-base dual wall UL listed 24 hr fuel tank <input type="checkbox"/> Sub-base dual wall UL listed 48 hr fuel tank <input type="checkbox"/> Emergency vent 12ft extension <input type="checkbox"/> 5 gallon spill containment
Generator	<ul style="list-style-type: none"> • Class H insulation • Drip proof generator air intake (NEMA 2,IP23) • Electrical design in accordance with BS5000 Part 99, EN61000-6, IEC60034-1, NEMA MG-1.33 • IP23 Protection 	<input type="checkbox"/> Generator upgrade 1 size <input type="checkbox"/> Permanent magnet excitation <input type="checkbox"/> Internal excitation <input type="checkbox"/> Anti-condensation space heater
Power Termination	<ul style="list-style-type: none"> • Circuit breakers, UL/CSA listed, 3 pole (100% rated) • Power center houses EMCP controller and control terminations (CB) • Segregated low voltage wiring termination panel • NEMA 1 steel enclosure, vibration isolated • Electrical stub-up area directly below circuit breaker 	<input type="checkbox"/> Auxiliary contacts <input type="checkbox"/> Shunt trip <input type="checkbox"/> Overload shutdown via breaker
Governor	<ul style="list-style-type: none"> • Adjustable Electronic governor 	
Control Panels	<ul style="list-style-type: none"> • EMCP 4.2 digital control panel • Vibration isolated NEMA 1 enclosure with lockable hinged door • DC and AC Wiring harnesses 	<input type="checkbox"/> NFPA110 upgrade <input type="checkbox"/> Control panel chassis
Lube		<input type="checkbox"/> Lube oil heater
Mounting	<ul style="list-style-type: none"> • Heavy-duty fabricated steel base with lifting points • Anti-vibration pads to ensure vibration isolation • Complete OSHA guarding • Stub-up pipe ready for connection to silencer pipework 	<input type="checkbox"/> IBC Seismic and OSHPD certification per Applicable Building Codes: IBC2000, IBC2003, IBC2006, IBC 2009, IBC 2012, CBC 2007, CBC 2010
Starting/Charging	<ul style="list-style-type: none"> • 12 volt starting motor • Batteries with rack and cables 	<input type="checkbox"/> Battery charger – UL 10 amp <input type="checkbox"/> Battery disconnect switch <input type="checkbox"/> Battery removal (does not remove rack and cables) <input type="checkbox"/> Coolant Heater
General	<ul style="list-style-type: none"> • High gloss polyurethane paint, Caterpillar Yellow except rails and radiators gloss black • Anticorrosive paint protection • All electroplated hardware 	<input type="checkbox"/> CSA Certified <input type="checkbox"/> Weather protective enclosure Industrial/Critical <input type="checkbox"/> Sound attenuated protective enclosure <input type="checkbox"/> Caterpillar tool set <input type="checkbox"/> Caterpillar White paint

STANDBY 40 ekW 50 kVA
PRIME 36 ekW 45 kVA
 60 Hz 1800 rpm 480 Volts



SPECIFICATIONS

STANDARD CAT GENERATOR		
Frame size	LC1514L	
Excitation	Self excitation	
Pitch	0.6667	
Number of poles	4	
Number of bearings	Single bearing	
Number of leads	012	
Insulation	Class H	
IP Rating	IP23	
Overspeed capability (%)	125	
Wave form deviation (%)	2	
Voltage regulator	Single phase sensing	
Voltage regulation	+/- 0.5% (steady state)	
Additional Voltage Information:		
Three Phase	Prime	Standby
208V Temp Rise	105°C / 189°F	130°C / 234°F
240V Temp Rise	105°C / 189°F	130°C / 234°F
480V Temp Rise	80°C / 144°F	105°C / 189°F
600V Temp Rise	80°C / 144°F	105°C / 189°F
- Consult your Cat dealer for other available voltages		
CAT DIESEL ENGINE		
C4.4 In-line 4, 4-cycle diesel		
Bore	105.0 mm (4.13 in)	
Stroke	127.0 mm (5.0 in)	
Displacement	4.4 L (268.5 in ³)	
Compression ratio	18.2:1	
Aspiration	T	
Fuel system	Common rail	
Governor type	Electronic (adjustable)	
EMISSIONS (Nominal¹)		
NOx + HC g/kWhr	4.42	
CO g/kWhr	1.02	
PM g/kWhr	0.26	

¹The nominal emissions data shown is subject to instrumentation, measurement, facility and engine to engine variations. Emissions data is based on 100% load.

CAT EMCP 4 SERIES CONTROLS

EMCP 4 controls including:

- Run / Auto / Stop Control
- Speed and Voltage Adjust
- Engine Cycle Crank
- 12 volt DC operation
- Environmental sealed front face
- Text alarm/event descriptions

Digital indication for:

- RPM
- DC volts
- Operating hours
- Oil pressure (psi, kPa or bar)
- Coolant temperature
- Volts (L-L & L-N), frequency (Hz)
- Amps (per phase & average)
- ekW, kVA, kVAR, kW-hr, %kW, PF

Warning/shutdown with common LED indication of:

- Low oil pressure
- High coolant temperature
- Overspeed
- Emergency stop
- Failure to start (overcrank)
- Low coolant temperature
- Low coolant level

Programmable protective relaying functions:

- Generator phase sequence
- Over/Under voltage (27/59)
- Over/Under frequency (81 o/u)
- Reverse power (kW) (32)
- Reverse reactive power (kVA) (32RV)
- Overcurrent (50/51)

Communications:

- Six digital inputs
- Four relay outputs (Form A)
- Two relay outputs (Form C)
- Two digital outputs
- Customer data link (Modbus RTU)
- Accessory module data link
- Serial annunciator module data link
- Emergency stop pushbutton

Compatible with the following:

- Digital I/O module
- Local annunciator
- Remote CAN annunciator
- Remote serial annunciator



STANDBY 40 ekW 50 kVA

PRIME 36 ekW 45 kVA

60 Hz 1800 rpm 480 Volts

TECHNICAL DATA

Open Generator Set – 1800 rpm/60 Hz/480 Volts	P3454C		P3454D	
Tier 3	Standby		Prime	
Generator Set Package Performance Genset power rating @ 0.8 pf Genset power rating with fan	50 kVA 40 ekW		45 kVA 36 ekW	
Fuel Consumption 100% load with fan 75% load with fan 50% load with fan	13.9 L/hr 10.8 L/hr 8.1 L/hr	3.7 gal/hr 2.9 gal/hr 2.1 gal/hr	12.6 L/hr 10.0 L/hr 7.6 L/hr	3.3 gal/hr 2.6 gal/hr 2.0 gal/hr
Cooling System¹ Air flow restriction (system) Engine coolant capacity with radiator/exp. tank Engine coolant capacity Radiator coolant capacity	0.12 kPa 16.5 L 7.0 L 9.5 L	0.48 in. water 4.4 gal 1.8 gal 2.5 gal	0.12 kPa 16.5 L 7.0 L 9.5 L	0.48 in. water 4.4 gal 1.8 gal 2.5 gal
Inlet Air Combustion air inlet flow rate	5.3 m ³ /min	187.2 cfm	5.2 m ³ /min	183.6 cfm
Exhaust System Exhaust stack gas temperature Exhaust gas flow rate Exhaust flange size (internal diameter) Exhaust system back pressure (maximum)	571°C 13.7 m ³ /min 63.5 mm 15.0 kPa	1060°F 483.8 cfm 2.5 in 60.2 in. water	532°C 12.8 m ³ /min 63.5 mm 15 kPa	990°F 452.0 cfm 2.5 in 60.2 in. water
Heat Rejection Heat rejection to coolant (total) Heat rejection to exhaust (total) Heat rejection to atmosphere from engine Heat rejection to atmosphere from generator	46.1 kW 66.9 kW 14.9 kW 4.2 kW	2622 Btu/min 3805 Btu/min 847.3 Btu/min 238.8 Btu/min	42.3 kW 59.3 kW 10.8 kW 3.6 kW	2406 Btu/min 3372 Btu/min 614.2 Btu/min 204.7 Btu/min
Alternator² Motor starting capability @ 30% voltage dip Frame Temperature rise	118 skV LC1514L 105°C	189°F	118 skV LC1514L 80°C	144°F
Lubrication System Total oil capacity Oil pan	8.4 L 6.9 L	2.2 gal 1.8 gal	8.4 L 6.9 L	2.2 gal 1.8 gal

¹For ambient and altitude capabilities consult your Cat dealer. Airflow restriction (system) is added to existing restriction from factory.

²Generator temperature rise is based on a 40°C (104°F) ambient per NEMA MG1-32.

STANDBY 40 ekW 50 kVA
PRIME 36 ekW 45 kVA
60 Hz 1800 rpm 480 Volts



DIMENSIONS

Package Dimensions		
Length	1932 mm	76 in
Width	1110 mm	44 in
Height	1767 mm	46 in

NOTE: For reference only – do not use for installation design. Please contact your local dealer for exact weight and dimensions. (General Dimension Drawing #3989305).

Performance No.: P3454C/D

Feature Code: NAC131P

Gen. Arr. Number: 3932523

Source: U.S. Sourced

LEHE0418-01 (04/13)

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