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| | APP. NUMBER | 506013 |
| | PROCESSED BY | SMP |
| | REVIEWED BY | |
| | DATE | 03/13/10 |

**PERMIT TO CONSTRUCT EVALUATION
DIESEL I. C. ENGINE (GROUND POWER)**

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|--------------------------|--|
| Applicant's Name | THE BOEING CO., C-17 PROGRAM |
| Company I.D. | 800038 |
| Mailing Address | 2401 E. WARDLOW ROAD, LONG BEACH, CA 90807 |
| Equipment Address | SAME AS ABOVE |

EQUIPMENT DESCRIPTION

Application No. 506013 (New construction Replacing Previous ICE, D398, A/N 345386, F20427)(D567)

INTERNAL COMBUSTION ENGINE, CUMMINS, MODEL NO. 8CEXL0275AAG, DIESEL-FUELED, FOUR CYCLE, FOUR CYLINDERS, LEAN BURN, TURBOCHARGED, AFTERCOOLED, 155 BHP, DRIVING AN HOBART GROUND POWER GENERATOR MODEL NO. QSB4.5.

Application No. 506011

TITLE V/RECLAIM MINOR REVISION

HISTORY

The Boeing Co. (C-17 Program) submitted the above application to permit a new diesel powered intra-facility portable internal combustion engine (ICE), which will replace an existing aircraft ground power ICE. The equipment is a CARB (U-R-002-0442) certified portable off-road engine. Also, it is an EPA certified engine under CEX-NRC1-08-31

The applicant currently operates a number of equipment under RECLAIM I. D. No. 800038 at this Long Beach location. The company manufactures aircraft at this site. Each equipment has different conditions.

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This new Tier 3 compliant 155 BHP portable ICE will be a functionally identical replacement of an existing 153 BHP portable aircraft ground power unit (D398) with reductions in all emissions. The engine is manufactured in March 2010. Since it is a qualified non-road portable engine per Rule 301(b)(21) & (b)(23); it will be subject to the emission requirements of 40 CFR Part 89 and will be exempt from District Regulation XIII [See applicability section of R1301(b)(3)].

This engine is exempt from the emissions and other requirements of subparagraph (d) of Rule R1110.2 per R1110.2(h)(6), as it is registered with the CARB under Title 13 of CCR by the manufacturer of the engine (Cummins). In addition, this engine will be exempt from these requirements per subparagraphs (h)(4) and (h)(5), as it will be used only for the following purposes:

1. Performance verification and testing of the engines.
2. Power other engines or gas turbines during start-ups.

The district data did not show any notices of violation or notices to comply issued against this facility in the last two years. Also, there were no complaints for visible emissions or odor nuisance in the district database in the last two years.

The facility is located within an industrial area. It is not located within 1000 feet from any school and there will not be any emission or MICR increases exceeding the threshold levels under this project. Hence, this application will not require a public notification per Rule 212. This facility is a Title V facility. A Title V renewal permit was issued to this facility on January 20, 2008. The proposed project is considered a “minor permit revision” to the Title V renewal permit, as described in Regulation XXX evaluation.

PROCESS DESCRIPTION

This non-emergency engine will provide energy to the aircraft on the ground. Based on the information provided by the manufacturer, this engine meets current BACT requirements. This diesel powered engine will replace one old ICE which provided power to the aircraft on the ground. This engine is turbocharged to increase the power of the engine. Turbocharging introduces more fuel in the cylinder with high pressure air. The engine is also aftercooled (through heat exchanger) to lower the temperature of the intake air. Decreasing the temperature increases the density, thereby allowing more air into the cylinder. This four cycle engine generally emits less pollutants than the two stroke engine, due to a higher percentage combustion rate of the fuel.

OPERATING HOURS

Average: 4 hour/day, 3 day/week, 50 weeks/year
Maximum : 24 hour/day, 3 day/week, 50 weeks/year

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EMISSION CALCULATIONS

The majority of the emissions are from the combustion of the fuel (in this case Diesel). Criteria air pollutants from engine exhaust are NO_x, ROG, CO, SO_x, and PM. NO_x formation depends on the temperature and pressure during the combustion. SO_x depends on the sulfur content of the fuel. ROG, CO, and PM are primarily the result of incomplete combustion. Data of the emissions were supplied by the manufacturer during the CARB certification process. The copies of the data are in the file.

OPERATING INFORMATION

| | | |
|------------------------------|----------------|----------------|
| Hours of operation (HRS/DAY) | 4.0 (Average) | 24.0 (Maximum) |
| Engine Horsepower (BHP) | 155 (Average) | 155 (Maximum) |
| Engine Speed (RPM) | 1700 (Average) | 1700 (Maximum) |
| Exhaust Flowrate | 824 (ACFM) | 824 (ACFM) |
| Temperature (Deg. F) | 880 | 880 |

EMISSION FACTORS

| POLLUTANTS | Maximum/Average GM/BHP-HR | Maximum/Average LB/HR |
|-----------------|------------------------------|--------------------------|
| ROG | 0.19 | 0.06 |
| NO _x | 2.66 | 0.91 |
| CO | 0.68 | 0.23 |
| SO _x | 0.0071* | Negligible |
| PM10 | 0.098 | 0.03 |

* District default factors from Annual Emission Inventories Guidelines

EMISSION CALCULATIONS

| Pollutant | Uncontrolled Emission Factors (Gms/bhp-hr) | Average/ Maximum Hourly (lbs/hr) | Average Daily @ 4 hrs/day (lbs/day) | Maximum Daily @ 24 hrs/day (lbs/day) | Existing ICE (D398) NSR emissions. (lbs/day) |
|-----------------|---|---|--|---|---|
| ROG | 0.19 | 0.06 | 0.24 | 1.44 | 5 |
| NO _x | 2.66 | 0.91 | 3.64 | 21.84 | 58 |
| SO _x | Negligible | Negligible | Negligible | Negligible | 4 |
| CO | 0.68 | 0.23 | 0.92 | 5.52 | 12 |
| PM10 | 0.098 | 0.03 | 0.12 | 0.72 | 1 |

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DSCFM for 824 ACFM = 265 (per formula in the SCAQMD Permit Processing Handbook)

$$\begin{aligned} \text{Particulate concentration} &= \text{lbs/hr PM} \times 7000 / \text{dscfm} \times 60 \text{ min/hr} \\ &= 0.03 \times 7000 / 265 \times 60 = 0.013 \text{ (grains/dscf)} \end{aligned}$$

This complies with Rule 404 requirements.

RULE 1401 EMISSIONS

The new engine is highly efficient and uses less fuel for the same power. The maximum diesel fuel usage for this engine will be 5.7 gallons per hour. The engine being replaced uses 6.8 gallons per hour diesel fuel (maximum rate). Thus, under this functionally identical replacement project there will be reduction in the toxic emissions resulting from the diesel fuel combustion. Thus, it will be exempt from the Rule 1401 requirements.

RULES/REGULATION EVALUATION

▣ **RULE 212, PUBLIC NOTIFICATION**

v **SECTION 212(c)(1):**

This section requires a public notice for all new or modified permit units that may emit air contaminants located within 1,000 feet from the outer boundary of a school. This source is not located within 1,000 feet from the outer boundary of a school. Therefore, public notice will not be required by this section.

v **SECTION 212(c)(2):**

This section requires a public notice for all new or modified facilities which have on-site emission increases exceeding any of the daily maximums as specified in subdivision (g). This ICE is replacing an existing old ICE with reductions in the criteria pollutants. As shown in the following table, the emission increases are below the daily maximum limits specified by Rule 219(g). Therefore, this application will not be subject to this section.

| LB/DAY | CO | NOX | PM₁₀ | ROG | SOX | Pb |
|-------------------|-----------|------------|------------------------|------------|------------|-----------|
| MAX. LIMIT | 220 | 40 | 30 | 30 | 60 | 3 |
| INCREASES | 0 | 0 | 0 | 0 | 0 | 0 |

v **SECTION 212(c)(3):**

As discussed in the above evaluation there will be reduction in the toxic emissions from this functionally identical replacement project. Thus, there will not be any increase in the MICR under this project. Therefore, this application will not be subject to this section.

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❖ **SECTION 212(g):**

This section requires a public notice for all new or modified sources which have on-site emission increases exceeding any of the daily maximums as specified by Rule 212 (g). As shown in the following table, the emission increases are below the daily maximum limits specified by Rule 212(g). Therefore, this application will not be subject to this section.

| LB/DAY | CO | NOX | PM₁₀ | ROG | SOX | Pb |
|-------------------|-----------|------------|------------------------|------------|------------|-----------|
| MAX. LIMIT | 220 | 40 | 30 | 30 | 60 | 3 |
| INCREASES | 5.52 | 21.84 | 0.72 | 1.44 | 0 | 0 |

▣ **RULES 401 & 402, VISIBLE EMISSIONS & NUISANCE**

No visible emissions are expected with proper operation and maintenance of the equipment.

▣ **RULES 404 & 405, PARTICULATE MATTER CONCENTRATION & WEIGHT**

With negligible PM emissions, compliance of the rule is expected.

▣ **RULE 1110.2, EMISSIONS FROM GASEOUS AND LIQUID FUELED STATIONARY INTERNAL COMBUSTION ENGINES**

The operator will maintain monthly engine operating log to comply with sub-paragraph (f)(2) requirements. Otherwise this engine is exempt from other requirements of subparagraph (d) per (h)(4) and (h)(5).

REGULATION XIII

▣ **RULE 1303(a), BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

This equipment complied with the U.S. EPA Tier 3 BACT requirements under 40 CFR Part 89. Thus it is exempt from XIII requirements per Rule 301(b)(3).

▣ **RULE 1401, NEW SOURCE REVIEW OF CARCINOGENIC AIR CONTAMINANTS**

As discussed in the above evaluation, there will be reduction in the toxic emissions from this functionally identical replacement project. Thus, it is exempt from this rule requirements.

▣ **RULE 1470, REQUIREMENTS FOR STATIONARY DIESEL-FUELED INTERNAL COMBUSTION AND OTHER COMPRESSION IGNITION ENGINES**

This is a portable engine, thus this rule requirements do not apply to this equipment.

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© **RULE 2005, NEW SOURCE REVIEW FOR RECLAIM**

(c)(1)(A) Best Available Control Technology

This equipment complied with the U.S. EPA Tier 2 BACT requirements with following emission levels.

| Pollutants | BACT Required | BACT Achieved |
|-------------------|----------------------|----------------------|
| ROG + NOx | 4.8 gram/bhp-hr | 3.0 gram/bhp-hr |

(c)(1)(B) Modeling

Modeling is not required since there will be reduction in NOx emissions under this replacement project.

(c)(2) Offsets

The Boeing Co. holds sufficient RTCs to offset the NOx emission increase.

(g)(4)

A modeling analysis for plum visibility is not required since there will not be net emission increase of NOx from the proposed project.

REGULATION XXX

The proposed project is considered as a “minor permit revision” to the current Title V permit for this facility since there is not an emission increase of pollutants subject to Reg. XIII or hazardous air pollutants. Rule 3000(b)(12) defines a “minor permit revision” as any Title V permit revision that does not result in any of the following:

- Emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or a higher Allocation amount which has previously undergone a significant permit revision process,
- Emission increase in hazardous air pollutants (HAPs) or pollutants subject to Reg. XIII, or
- Installation of a new permit unit or the modification or reconstruction of an existing permit unit subject to a New Source Performance Standard (NSPS) per 40 CFR Part 60 or a National Emission Standard for HAPs per 40 CFR Part 61 or Part 63.

Rule 3003(j) specifies that all proposed Title V permit revisions shall be submitted to EPA for review. This is the first permit revision of the Title V permit renewal requested by the facility. The cumulative emission increases resulting from this proposed permit revision are summarized as follows:

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| Revision | HAP | VOC | NOx | PM ₁₀ | SOx | CO |
|--|-----|-----|-----|------------------|-----|-----|
| 1 st Permit Revision, Replacement of ICE (A/N 506013) | 0 | 0 | 0 | 0 | 0 | 0 |
| Cumulative Total | 0 | 0 | 0 | 0 | 0 | 0 |
| Maximum Daily | 30 | 30 | 40 | 30 | 60 | 220 |

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| CONCLUSIONS/RECOMMENDATIONS |
|------------------------------------|

The proposed project is expected to comply with all applicable District Rules and Regulations. Since the proposed project is considered as a “minor permit revision”, it is exempt from the public participation requirements under Rule 3006 (b). A proposed permit incorporating this permit revision will be submitted to EPA for a 45-day review pursuant to Rule 3003(j). If EPA does not have any objections within the review period, a revised Title V permit will be issued to this facility.