

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT STATIONARY SOURCE AND COMPLIANCE DIVISION <i>Large Coating, Printing and Chemical Operations Team</i> APPLICATION PROCESSING AND CALCULATIONS	PAGE	1 of 7
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	PROCESSED BY	SMP
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**PERMIT TO OPERATE EVALUATION
NATURAL GAS FUELED BOILERS & ICE**

Applicant's Name	THE BOEING COMPANY C-17 PROGRAM
Company I.D.	800038
Mailing Address	3855 LAKEWOOD BLVD., LONG BEACH, CA 90846
Equipment Address	3855 LAKEWOOD BLVD., LONG BEACH, CA 90846

EQUIPMENT DESCRIPTION

Application No. 544118

RECLAIM/TITLE V PERMIT REVISION

Application No. 544119 [Previous A/N 491819 (Superseding A/N 523973), P/N G17605] (D549)

BOILER, CLEAVER BROOKS, MODEL NO. CEW 700-400 150#HW, FIRETUBE TYPE FOR HOT WATER, 29' – 9" L.X 11' – 2" W. X 5' – 7" H., 16.75 MM BTU PER HOUR MAXIMUM HEAT INPUT RATE, NATURAL GAS FIRED, WITH A LOW NOX CLEAVER BROOKS BURNER, MODEL NO. PROFIRE-NT.

Application No. 544120 [Previous A/N 491820 (Superseding A/N 523976), P/N G17606] (D551)

BOILER, CLEAVER BROOKS, MODEL NO. CEW 700-400 150#HW, FIRETUBE TYPE FOR HOT WATER, 29' – 9" L.X 11' – 2" W. X 5' – 7" H., 16.75 MM BTU PER HOUR MAXIMUM HEAT INPUT RATE, NATURAL GAS FIRED, WITH A LOW NOX CLEAVER BROOKS BURNER, MODEL NO. PROFIRE-NT.

Application No. 544121 [Previous A/N 491821 (Superseding A/N 523977), P/N G17607] (D553)

BOILER, CLEAVER BROOKS, MODEL NO. CEW 700-800, FIRETUBE TYPE FOR HOT WATER, 30' – 4" L.X 11' – 2" W. X 5' – 7" H., 33.48 MM BTU PER HOUR MAXIMUM HEAT INPUT RATE, NATURAL GAS FIRED, WITH A LOW NOX CLEAVER BROOKS BURNER, MODEL NO. PROFIRE-NT.

Application No. 544144 (C/C, Previous A/N 506013, P/N G13388) (D567)

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

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HISTORY

The Boeing Company – C17 program submitted above applications to change the permit descriptions of the three permitted boilers and one Internal Combustion Engine (ICE). The applicant has requested to correct the equipment descriptions (for Btu ratings) of boilers (A/Ns 544119 & 544120) from 16.3 mmBtu/Hr to 16.75 mmBtu/Hr. The applicant requested to correct the Btu rating of a boiler (A/N 544121) from 32.5 mmBtu/Hr to 33.48 mmBtu/Hr. The name plates indicated different Btu ratings on all the three boilers compared to data on the boiler specifications supplied during the original permit applications. All the three boilers are installed in their C-17 aircraft production area. The boilers are used to provide comfort air and heating to the spray booths (hangers) and buildings.

The applicant also requested to correct the model no. (QSB4.5) on the ICE (Device no. D567). The current permit description states the EPA family no. of the ICE (8CEXL0275AAG) as its model no. The original application indicated model no. being QSB4.5.

The applicant has not requested any other changes from the current permit conditions (boilers & ICE) which will affect the other emissions from these boilers and ICE. The natural gas usage limits for the three boilers as shown in the following table will remain the same. The applicant has a single combined usage limit for all three boilers for some flexibility in their operation, which will also remain the same.

Current Application No.	Previous Application No.	Previous Application No.	Boiler Device No.	BTU Rating MmBTU/hr	Therm Usage limit requested
544119	491819	523973	D549	16.75	81560
544120	491820	523976	D551	16.75	70416
544121	491821	523977	D553	33.48	122850
TOTAL					274826

The previous applications (nos. 491819/20/21) were submitted in November 2008 to change the annual source testing requirement from once a year to 3 years, to reflect the most Rule 1146 amendment. These applications were accepted as change of condition of previous applications 436753/4/5. However the approval of these applications was delayed till 2012, as the Rule 1146 SIP approval was not completed until then. During this period, the applicant submitted applications (nos. 523973/6/7) in year 2011 to increase the CO emissions. The applicant requested to increase the CO emission limit to the BACT requirement of 50 ppmv at 3% O₂ from the 10 ppmv at 3% O₂ offset requirement. When previous applications nos 491819/20/21 were approved they could not change the computer data for previous application #s to 523973/6/7 due to application submittal dates. Hence, CO emissions for applications (nos 491819/20/21) did not reflect CO emissions of applications 523973/6/7. Therefore CO emissions for all previous applications 491819/20/21 will be updated to reflect CO data of application 523973/6/7 before the approval of current applications.

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Application no. 544144 is an administrative change application only to correct the model number of the ICE. Hence, no offsets will be required for this project. The ICE is a Tier 3 compliant Hobart 155 BHP portable aircraft ground power unit, which was a functionally identical replacement of an existing 153 BHP portable aircraft ground power unit (D398) with reductions in the emissions. Thus, no offsets were required for this ICE, when initially permitted. With the reduction in the emissions, it was also exempt from modeling and R1401 requirements. This ICE also complied with the BACT requirements per the CARB certificate.

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

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

Boeing manufactures military and civilian aircrafts at this location. The company operates a number of permitted equipment such as spray booths, ovens, boilers, degreasers, I.C. engines, scrubbers, storage tanks, chemical process lines, afterburner, etc. under the RECLAIM/Title V permit.

The District database shows that the applicant has not received any odor nuisance complaints from the public in the last two years. The company also has not received any Notices to Comply or Notice of Violation in the last two years. This facility is not located within 1000 feet from any school and there are no emission increases exceeding Rule 212 thresholds from this project, hence, these applications will not require a public notice.

This facility is a Title V facility. A Title V renewal permit was issued to this facility on January 20, 2013. The proposed project is considered a “minor permit revision” to the initial Title V permit, as described in Regulation XXX evaluation.

PROCESS DESCRIPTION

The boilers emit combustion pollutants such as NO_x, CO, PM₁₀, SO_x, ROG and hazardous air pollutants. Each boiler is equipped with a high radiant multi-port burner. The heat from the combustion products, which flow through tubes, is transferred to water which circulates outside of the tubes. The boiler manufacturer informed the District that the boilers do not emit more than 10 ppmv CO emissions, if not used at less than 25% of the maximum heat input. Manufacturer has provided a mechanical inter-lock device on all the boilers so that they cannot be operated below 25% load.

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These boilers are equipped with low-NOx burners and flue gas recirculation to meet the BACT requirements for NOx emissions (9 ppmv for CEW 700-800 and 12 ppmv for CEW 700-400). Low NOx burners reduce NOx emissions by combusting in stages. Staging partially delays the combustion process, resulting in a cooler flame which suppresses NOx formation.

In the flue gas recirculation system, a portion of the flue gas is recycled from the stack to the burner wind box. Upon entering the wind box, the gas is mixed with combustion air prior to be fed to the burner. The recycled flue gas contains combustion products which act as inert materials during combustion. This additional mass is heated in the combustion zone, thereby lowering the peak flame temperature and reducing the NOx formation. To a lesser extent, flue gas recirculation also reduces oxygen content in the flame zone and as a result forms less NOx.

The non-emergency engine provides energy to the aircraft on the ground. Based on the information provided by the manufacturer, the engine met BACT requirements. The engine is turbocharged/aftercooled to increase the power of the engine and reduce emissions.

OPERATING HOURS

Average: 24 hour/day, 7 day/week, 52 weeks/year
Maximum: 24 hour/day, 7 day/week, 52 weeks/year

EMISSION CALCULATIONS

The proposed changes are of administrative nature only as the equipment description only will not result in any changes in emissions, therefore, emission data from each existing permits to the respective new application. A summary of NSR 30-day average is shown below from previous applications.

Emission Summary (NSR 30 day average)

A/N	Equipment	CO (lbs/day)	NOx (lbs/day)	PM10 (lbs/day)	VOC (lbs/day)	SOx (lbs/day)
523973	CEW 700-400	10.23	3.48	1.17	1.30	0*
523976	CEW 700-400	8.82	4.03	1.36	1.50	0*
523977	CEW 700-800	15.41	6.03**	2.05	2.26	0*

* Emission is less than 0.5 lb/day

** Based on NOx concentration of 12 ppmv @ 3% O₂

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I.C. Engine

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 following data were obtained from the previous permit application for this equipment.

EMISSION CALCULATIONS

Pollutant	Uncontrolled Emission Factors (g/bhp-hr)	Average/Maximum Hourly (lbs/hr)	Average Daily @ 4 hrs/day (lbs/day)	Maximum Daily @ 24 hrs/day (lbs/day)
ROG	0.19	0.06	0.24	1.44
NO _x	2.66	0.91	3.64	21.84
SO _x	Negligible	Negligible	Negligible	Negligible
CO	0.68	0.23	0.92	5.52
PM ₁₀	0.098	0.03	0.12	0.72

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. These sources are not located within 1,000 feet from the outer boundary of a school. Therefore, public notice is not 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). As shown in the following table, the emission increases for all the boilers are below the daily maximum limits specified by Rule 212(g). Therefore, these applications are not subject to this section.

LB/DAY	CO	NOX	PM ₁₀	ROG	SOX	Pb
MAX. LIMIT	220	40	30	30	60	3
INCREASES	0	0	0	0	0	0

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▼ **SECTION 212(c)(3):**

There are no toxic emission increases under this project. Therefore, these applications are not subject to this section.

▼ **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 in subdivision. As shown in the following table, the emission increases are below the daily maximum limits specified by Rule 212(g). Therefore, these applications are not subject to this section.

LB/DAY	CO	NOX	PM ₁₀	ROG	SOX	Pb
MAX. LIMIT	220	40	30	30	60	3
INCREASES	0	0	0	0	0	0

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

No visible emissions are expected with proper operation of the equipment. The equipment is in operation for a number of years without any complaints from the public.

▣ **RULES 404, PARTICULATE MATTER - CONCENTRATION**

With proper operation of the equipment, the equipment is expected to comply with the requirements.

▣ **RULE 1146, EMISSIONS OF OXIDES OF NITROGEN FROM BOILERS AND HEATERS**

This rule requires natural gas fired boilers to emit no more than 30 ppmv of NO_x at 3% O₂. The emissions of NO_x from these boilers are 12 ppmv or less at 3% O₂ for the CEW 700-400 boilers and 9 ppmv at 3% O₂ for the CEW 700-800 boiler. Previous source test results confirmed compliance of these boilers. Also, this is a NO_x RECLAIM facility and thus Reg XX supersedes this requirement.

The 400 ppm CO emission limit is set in order to prevent emissions of higher CO to lower the NO_x emissions. Previous source test results confirmed compliance of these boilers.

REGULATION XIII

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

This equipment is not subject to these requirements because there is no increase in emissions from this project.

▣ **RULE 1303(b)(1), MODELING**

No detailed modeling analysis is required as there will not be any emission increases under this project.

▣ **RULE 1303 (b)(2), EMISSION OFFSETS**

There are no emission increases under this project. Thus, no offsets are required for this project.

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

There will not be any emission increases under this project. Thus, Rule 1401 does not apply.

REGULATION XXX

The proposed project is considered as a “minor permit revision” to the Title V permit for this facility. Rule 3000(b)(12)(vi) defines a “minor permit revision” as any Title V permit revision that does not result in an increase in emissions of a pollutant subject to Regulation XIII – New Source Review (non-RECLAIM pollutants) or a hazardous air pollutant (HAP).

The proposed project is not expected to result in an increase in emissions of a pollutant subject to Regulation XIII – New Source Review (non-RECLAIM pollutants) or a hazardous air pollutant (HAP), and therefore is considered as a “minor permit revision” pursuant to Rule 3000(b)(12)(A)(vi).

This proposed project is the 1st permit revision to the renewed Title V permit issued to this facility on January 20, 2013. The following table summarizes the permit revisions since this Title V permit:

Revision	HAP	VOC	NO _x	PM ₁₀	SO _x	CO
1 st Minor Permit Revision. Modifications of Boilers (A/N 544119/20/21) and administrative change of ICE (A/N 544144)	0	0	0	0	0	0
Cumulative Total	0	0	0	0	0	0
Maximum Daily	30	30	40	30	60	220

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.