2.3.1 STATIONARY DIESEL ENGINES

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Process Description
Stationary diesel engines are internal combustion (IC) engines used in generators, pumps, and material handling equipment (such as tub grinders). Additional background information is available from Chapters 3.3 Gasoline and Diesel Industrial Engines and 3.4 Large Stationary Diesel and All Stationary Dual-fuel Engines of AP-42 (Fifth Edition, Volume I). This chapter shall cover exempt, loss of exemption, emergency, and prime stationary diesel engines. Portable diesel engines are covered in Permit Handbook Chapter 2.3.3.

Exempt Engines – The following engines are exempt from District permitting requirements (Regulation 2-1-301 and 2-1-302):

1. IC engines which are less than 50 HP (exempt per Regulation 2-1-114.2.1); and
2. IC engines used for instructional purposes at research, teaching, or educational facilities (exempt per Regulation 2-1-114.2.3).

Loss of Exemption (LOE) Engines – On May 17, 2000, the general IC engine permit exemption was lowered from 250 to 50 HP. In addition, the exemption for portable and standby IC engines, and standby gas turbines was amended to allow equipment to operate for no more than 200 hours in any calendar year (plus 100 hours per calendar year for maintenance and testing) without triggering permit requirements. Subsequently, that permit exemption for portable and standby IC engines, and standby gas turbines was deleted on September 1, 2001. As a result, the following engines are considered LOE engines:

1. IC engine less than 250 HP installed prior to May 17, 2000 (LOE – Regulation 2-1-113.2.8);
2. Portable or standby IC engine installed prior to May 17, 2000 which was used on a temporary basis of no more than 30 days per calendar year at any one facility or used for the emergency pumping of water (LOE – Regulation 2-1-113.10); and
3. Portable or standby IC engine installed prior to September 1, 2001 which was used for no more than 200 hours in any calendar year (plus 100 hours per calendar year for maintenance and testing) and not subject to permits per Regulation 2-1-319 (LOE – Regulation 2-1-114.2.3)

Completeness Determination
The following District forms should be completed and fees provided for stationary diesel engines. Use the Completeness Determination Checklist to verify completeness. Use the Data Form Guidance to ensure that the forms are completed correctly. Use the Fee Calculation Guidance to ensure that the fees are calculated accurately.

1. Form 101-B (one for facility).
2. Form ICE (1 per engine).
3. Manufacturer specification data including: fuel consumption, rated horsepower output, emission rates for NOx, CO, hydrocarbons (VOC) and particulate.
4. CARB-certified emission data or if no CARB-certified data, then EPA-certified emission data. If no such certified data exists, then load adjusted data from D2 testing.
5. For engines installed after May 17, 2000, Form HRSA (one per source).
6. Fees, calculated per Regulation 3 (Schedule B). If engine is a LOE engine, then the fees shall be calculated according to the policy for LOE engines.

Emission Calculations
The primary pollutants from IC engines are oxides of nitrogen (NOx), hydrocarbon and other organic compounds (POC), carbon monoxide (CO), sulfur dioxide (SO2), and particulate (PM10). In calculating these emissions, emission factor data from CARB, EPA, and/or the manufacturer are used to estimate emissions for NOx, CO, POC, and PM10. If NOx and POC (hydrocarbon) have a combined emission factor, District policy is to estimate that 5% of the NMHC+NOx emission factor as the POC emission factor when the CARB HC emission factor isn't available independently. The SO2 emission factor is 0.05 lb/MMBTU from EPA AP-42, Table 3.4-1, which is based on full conversion of fuel sulfur to SO2 and which will therefore be considered applicable to any diesel engine (sulfur content will be assumed to be the California limit of 0.05 wt% sulfur). Although there is a different SO2 emission factor indicated for engines under 600 HP from EPA AP-42, Table 3.3-1, it's been determined that this emission factor is not representative because it does not take sulfur content into consideration. PM10 certified level no greater

than 0.1 g/bhp-hr means an emission level of 0.15 g/bhp-hr or less as determined during a steady-state engine certification test (ISO 8178).

Fire Pumps & Other Engines with No Emission Factor Data – Because of the special requirements of fire pumps, the engines on fire pumps are rarely CARB- or EPA- certified. In addition, the manufacturer rarely has emission factor data on these fire-pump modified engines. As a result, if no data exist, then emission factor data from EPA AP-42, Table 3.4-1, should be used.

The emission factors, which are typically in grams per brake-horsepower-hour (g/bhp-hr), are multiplied by the maximum annual hours of operations and the brake horsepower of the engine to determine the annual rates of emissions of the various criteria pollutants. Note that unless CARB or EPA certified emission factor data is used, the permit evaluator shall require source testing for any engine over 250 HP to verify the manufacturer's emission factors, per District policy.

LOE Engines – In general, emission data on LOE engines often does not exist, because the engines predated existing emission standards. Because there is no cumulative increase associated with a LOE sources, per Regulation 2-2-212, emission calculations are not required for a LOE diesel engine.

Applicable Requirements

District Rules and Regulations

All stationary diesel engines are subject to the Ringelmann No. 2 limitations of Regulation 6-303 (emissions opacity limitations). Properly operated and maintained engines are expected to meet this requirement. All stationary diesel engines are also subject to the SO2 limitations of Regulation 9-1-302 (ground level concentration) and 9-1-304 (0.5% by weight in fuel). Compliance with both Regulations 9-1-302 and 9-1-304 is likely since California law mandates using diesel fuel with a 0.05% by weight sulfur.

Any stationary diesel engine which operates exclusively using diesel fuel is not be subject to the requirements of Regulations 9-8-301, 9-8-302, and 9-8-502 per Regulation 9, Rule 8, Section 110.2. However, emergency standby engines are subject to the requirements of Regulation 9-8-330, while those emergency engines for essential public use, as defined in Regulation 9-8-233, are subject to Regulation 9-8-331. Regardless of the operating hours allowed in Regulation 9-8-330 or 9-8-331, the permit evaluator cannot approve engine-operating hours in excess of what would fail a Risk Screening Analysis or any operating limitation specified in the Airborne Toxic Control Measure for Stationary Compression Ignition Engines (ATCM).

ATCM

In implementing the ATCM, the District developed permit conditions (see Permit Condition Guidance) that applies to new engines effective January 1, 2005. New engines are those engines installed at a facility after January 1, 2005; section (d)(44) of the ATCM (page 10) provides the full definition. The permit evaluator cannot approve engine-operating hours in excess of what would fail a Risk Screening Analysis or any operating limitation specified in the ATCM.

New Emergency Use Engines: Per Table 1 of the ATCM (page 17), if the PM emission rate is CARB-certified to be less than 0.15 g/bhp-hr, then a maximum of 50 hours is allowed for new engine reliability related activities. If the PM emission rate is CARB-certified to be less than 0.01 g/bhp-hr, then a maximum of 100 hours is allowed for new engine reliability-related activities. Source testing may be required to demonstrate compliance with the ATCM, per District policy; the policy clarifies how to demonstrate the 0.01 g/bhp-hr standard.

In addition, if the engine is located within 500 feet of any school, there are further restrictions on use at and nearby school by Subsection (e)(2)(A)1. To incorporate these requirements of the ATCM, permit conditions have been developed for new stationary engines (see Permit Condition section). Permits for new stationary emergency standby diesel engines should include these permit conditions, unless they are exempt per Section (c) of the ATCM.

"In-Use" Emergency Engines: This category includes LOE engines. Per Table 2 of the ATCM (page 21), if the PM emission rate is CARB-certified to be less than 0.01 g/bhp-hr, then a maximum of 100 hours is allowed for "in-use" engine reliability related activities. Source testing may be required to demonstrate compliance with the ATCM, per District policy; the policy clarifies how to demonstrate the 0.01 g/bhp-hr

standard. However, if the PM emission rate is unknown, then only 20 hours is allowed for "in-use" engine reliability related activities. If the PM10 emission rate is CARB-certified to be between 0.01 and 0.4 g/bhp-hr, then the hours allowed are specified by the schedule in Table 2 of the ATCM (page 21). In addition, if the engine is located within 500 feet of any school, there are further restrictions on use at and nearby school by Subsection (e)(3)(B)2 of the ATCM.

New Prime Use Engines: The permit evaluator shall review the necessary emission test results and other documentation to determine compliance with the 0.01 g/bhp-hr PM emission limit of the ATCM prior to permit issuance. Source testing may be required to demonstrate compliance with the ATCM, per District policy; the policy clarifies how to demonstrate the 0.01 g/bhp-hr standard. The ATCM PM emission limit, and the records to document compliance with this limit, are not needed as permit conditions. Note that the hours of operation may need to be limited to pass the Risk Screening Analysis.

"In-Use" Prime Use Engines: According to the ATCM requirements for prime use engines (pages 25 and 26), must meet the emission standards indicated in Table 4 of the ATCM (page 25). The permit evaluator shall review the application information for compliance with the emission standards. Source testing may be required to demonstrate compliance with the ATCM, per District policy.

BACT

Unless they are LOE engines, BACT for stationary diesel engines is specified in the BACT/TBACT Workbook. The following are the applicable BACT requirements for diesel engines:

Internal Combustion Engines
- I. C. Engine - Compression Ignition < 175 hp
- I. C. Engine - Compression Ignition >= 175 hp

Unless they are LOE engines, for non-emergency diesel engines (i.e., prime use engine), a diesel engine will be permitted only if a gas-fueled engine, or electric motor, is not practical (e.g., a remote location without natural gas availability or electric power, or only a diesel engine will meet the portability and/or power/torque/rpm requirements of the application under review, or the engine is used exclusively for emergency use during involuntary loss of power). The permit evaluator must ensure that the applicant explains why gas fueled engines are not practical for any non-emergency diesel engine under evaluation.

Inform the BACT Coordinator of updates to the BACT/TBACT Workbook.

LOE Engines – BACT review requirements are not triggered for LOE engines, because they are not considered new or modified sources.

CEQA

Permit applications which are reviewed following the specific procedures, fixed standards and objective measurements set forth in this chapter (2.3.1) are classified as ministerial and will accordingly be exempt from CEQA review per Regulation 2-1-311.

Risk Screening Analysis

Unless they are LOE engines, typically any stationary diesel engine over 50 hp will require a risk screening because the toxics trigger level for diesel particulate is low (0.5 lbs/yr). In addition, a Risk Management Policy for Diesel Engines applies. A permit applicant may apply alternative and/or additional emissions control (e.g., catalyst-based diesel particulate filters (DPFs), diesel oxidation catalysts, ultra-low sulfur diesel fuel) or other risk reduction measures (e.g., increasing stack height within what is considered Good Engineering Practice, maximizing source/receptor separation distances, modifying operating hours to minimize public exposure) as necessary to reduce risks to acceptable levels specified in the policy. All engines not equipped with a DPF must be "plumbed" to facilitate the installation of a DPF at a future date.

In addition to the above-mentioned source-specific applicable requirements, other requirements may also be applicable depending on the facility, its application emissions, and its source location:

- Offsets
- Prevention of Significant Deterioration
- School Notification

LOE Engines – Offsets, PSD, and school notification requirements are not triggered for LOE engines, because they are not considered new or modified sources.

Permit Conditions

Standardized conditions for stationary diesel engines are available from the Permit Condition Guidance. Refer to the Evaluation Report Template Guidance to obtain the Microsoft Word formatted permit conditions for this source category.