

## SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT

### **RULE 4702 - INTERNAL COMBUSTION ENGINES – PHASE 2**

*(Adopted August 21, 2003)*

#### 1.0 Purpose

The purpose of this rule is to limit the emissions of nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and volatile organic compounds (VOC) from spark-ignited internal combustion engines.

#### 2.0 Applicability

This rule applies to any spark-ignited internal combustion engine with a rated brake horsepower greater than 50 horsepower and that requires a Permit-to-Operate (PTO).

#### 3.0 Definitions

- 3.1 Beam-balanced pumping engine: A cyclic loaded engine powering an oil well pump, with the pump counterweight on the back end of the walking beam. The counterweight is moved mechanically without a cylinder supplying air pressure.
- 3.2 California Reformulated Gasoline: Gasoline meeting California Air Resources Board requirements for motor vehicle fuel in accordance with California Code of Regulations, Chapter 5, Article 1, Subarticle 2 - Standards for gasoline sold beginning March 1, 1996.
- 3.3 CO: Carbon monoxide.
- 3.4 Crank-balanced pumping engine: A cyclic loaded engine powering an oil well pump, with the pump counterweight attached to a gearbox which is attached to the walking beam with a pitman arm. The counterweight is moved mechanically, in a circular motion, without a cylinder supplying air pressure.
- 3.5 Cyclic Loaded Engine: An internal combustion engine that, under normal operating conditions, varies in shaft load by 40% or more of rated brake horsepower during recurrent periods of 30 seconds or less or is used to power an oil well reciprocating pump unit.
- 3.6 De-rated Engine: An internal combustion engine which has been physically limited and restricted by permit condition to an operational level of less than 50 horsepower.
- 3.7 Diesel Engine: A compression-ignited internal combustion engine.

- 3.8 Disaster or State of Emergency: A fire, flood, earthquake, or other similar natural catastrophe.
- 3.9 Distributed Generation (DG): Relatively small power plants, such as internal combustion engine gensets, which are used to generate electrical power that is either fed into the power grid or used on-site. DG units are located throughout the grid and are usually sited in or close to load centers or utility customers' sites. Distributed Generation also refers to a mechanical drive system consisting of one or more internal combustion engines and electric motors, where use of the internal combustion engines or electric motors is interchangeable.
- 3.10 Emergency Standby Engine: An internal combustion engine which operates as a temporary replacement for primary mechanical or electrical power during an unscheduled outage caused by sudden and reasonably unforeseen natural disasters or sudden and reasonably unforeseen events beyond the control of the operator. An engine shall not be considered to be an emergency standby engine if it is used for purposes other than: periodic maintenance, periodic readiness testing, readiness testing during and after repair work, unscheduled outages, or to supply power while maintenance is performed or repairs are made to the primary power supply, and if it is not limited by permit condition to operate 100 hours or less per calendar year for non-emergency purposes as determined by an operational nonresettable elapsed operating time meter. An engine shall not be considered to be an emergency standby engine if it is used: (1) to reduce the demand for electrical power when normal electrical power line service has not failed, or (2) to produce power for the utility electrical distribution system, or (3) in conjunction with a voluntary utility demand reduction program or interruptible power contract.
- 3.11 Exhaust Control: Device or technique used to treat an engine's exhaust to reduce emissions, and include, but is not limited to, catalysts, afterburners, reaction chambers, and chemical injectors.
- 3.12 Flood: A sudden and reasonably unforeseen rising and overflowing of a body of water especially onto normally dry land.
- 3.13 Gaseous Fuel: A fuel which is a gas at standard conditions including but not limited to natural gas, methane, ethane, propane, butane and liquefied petroleum gas (LPG).
- 3.14 Internal Combustion Engine: Any spark- or compression-ignited reciprocating engine.
- 3.15 Lean-Burn Engine: Any spark-ignited internal combustion engine that is operated with an exhaust stream oxygen concentration of four (4) percent by volume, or greater prior to any exhaust stream control device.
- 3.16 Location: Any single site at a building, structure, facility, or installation.

- 3.17 Military Tactical Equipment: A transportable engine operated by the United States armed forces or National Guard which is designed specifically for military use in an off-road, dense terrain; hostile environment; or aboard military combat vessels.
- 3.18 NOx: Oxides of nitrogen, calculated as equivalent nitrogen dioxide (NO<sub>2</sub>).
- 3.19 Rated Brake Horsepower: The continuous brake horsepower rating specified for the engine by the manufacturer or listed on the nameplate of the unit, unless otherwise physically limited and specified by a condition on the engine's Permit-to-Operate.
- 3.20 Rich-Burn Engine: Any spark-ignited internal combustion engine that is operated with an exhaust stream oxygen concentration of less than four (4) percent by volume prior to any exhaust stream control device.
- 3.21 Spark-ignited Internal Combustion Engine: A liquid or gaseous fueled engine designed to ignite its air/fuel mixture by a spark across a spark plug.
- 3.22 Stationary Source: As defined in Rule 2201 (New and Modified Stationary Source Review Rule).
- 3.23 Transportable engine: An engine designed to be and capable of being carried or moved from one location to another, and that is operated at one location for no more than 12 consecutive months. Indications of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.
- 3.23.1 A transportable engine that replaces a transportable engine at a location will be included in calculating the consecutive time if it performs the same function as the engine being replaced. In that case, the cumulative time of both engines, including the time between the removal of the original unit and installation of the replacement unit, would be counted towards the consecutive time period.
- 3.23.2 A replacement engine is not transportable if it performs the same function as the replaced engine and remains at the location for more than 12 consecutive months.
- 3.23.3 An engine is not transportable if it remains or will remain at a location for less than 12 consecutive months where such a period represents the length of normal annual source operations of the stationary source.
- 3.23.4 An engine is not transportable if it is removed from one location for a period and then returned to the same location in an attempt to circumvent the residence time requirement.

3.23.5 The period during which an engine is maintained at a storage facility shall be excluded from the time used to determine the resident time requirement.

3.24 VOC: Volatile organic compounds, as defined in Rule 1020 (Definitions).

3.25 Waste Gas: An untreated, raw gas derived through a natural process, such as anaerobic digestion, from the decomposition of organic waste at municipal solid waste landfills or publicly owned wastewater treatment facility. Waste gas includes landfill gas which is generated at landfills, digester gas which is generated at sewage treatment facilities, or a combination of the two.

#### 4.0 Exemptions

4.1 The requirements of this rule do not apply to engines in agricultural operations in the growing of crops or raising of fowl or animals.

4.2 Except for the requirements of Sections 5.6.6, 6.1, and 6.2.3, the requirements of this rule shall not apply to:

4.2.1 An emergency standby engine.

4.2.2 An internal combustion engine limited by permit condition to operate no more than 200 hours per calendar year as determined by an operational nonresettable elapsed operating time meter and which is not used to generate electrical power that is either fed into the electrical utility power grid or used to reduce electrical power purchased by a stationary source; to generate mechanical power that is used to reduce electrical power purchased by a stationary source; or in a distributed generation application.

4.3 Except for the administrative requirements of Sections 6.1 and 6.2.3, the requirements of this rule shall not apply to:

4.3.1 An internal combustion engine that meets the following conditions:

4.3.1.1 The engine is operated exclusively to preserve or protect property, human life, or public health during a disaster or state of emergency, such as a fire or flood, and

4.3.1.2 Except for operations associated with Section 4.3.1.1, the engine is limited by permit condition to operate no more than 100 hours per calendar year as determined by an operational nonresettable elapsed operating time meter, for periodic maintenance, periodic readiness testing, and readiness testing during and after repair work of the engine.

4.3.2 An internal combustion engine registered as a portable emissions unit under Rule 2280 (Portable Equipment Registration) or the Statewide Portable Equipment Registration Program pursuant to Sections 2450-2465, Article 5, Title 13, California Code of Regulations.

4.3.3 Military Tactical Equipment.

4.3.4 Transportable engines.

4.4 The requirements of this rule shall not apply to a de-rated engine, provided the de-rating occurred before June 1, 2004.

## 5.0 Requirements

5.1 Engine Emission Limits - The owner of an internal combustion engine shall not operate it in such a manner that results in emissions exceeding the limits in the Engine Emission Limits table below for the appropriate engine type, according to the compliance schedule listed in Section 7.0. An engine shall be restricted by permit condition to emissions limits, in ppmv (corrected to 15% oxygen on a dry basis), that meet or exceed the applicable emission limits pursuant to Section 5.1 or Section 8.2.

Table 1 Engine Emission Limits (corrected to 15% oxygen on a dry basis)

Engine Type	NO <sub>x</sub>	CO	VOC
<b>1. Rich-Burn</b>			
a. Waste gas fueled	50 ppmv or 90% reduction	2000 ppmv	250 ppmv
b. Cyclic loaded, field gas fueled	50 ppmv	2000 ppmv	250 ppmv
c. All other engines	25 ppmv or 96% reduction	2000 ppmv	250 ppmv
<b>2. Lean-Burn</b>			
a. Two stroke, gaseous fueled, less than 100 horsepower	75 ppmv or 85% reduction	2000 ppmv	750 ppmv
b. All other engines	65 ppmv or 90% reduction	2000 ppmv	750 ppmv

5.2 All continuous emission monitoring systems (CEMS) emissions measurements shall be averaged over a period of 15 consecutive minutes. Any 15-consecutive-minute block average CEMS measurement exceeding the applicable emission limits of this rule shall constitute a violation of this rule.

5.3 Percent emission reductions, if used to comply with the NO<sub>x</sub> emission limits of Section 5.1, shall be calculated as follows:

5.3.1 For engines with external control devices that are not operated in combination with a second emission control device or technique, percent reduction shall be calculated using emission samples taken at the inlet and outlet of the control device.

5.3.2 For engines without external control devices and for engines with an external control device in combination with a second emission control device or technique, percent reduction shall be based on source test results for the uncontrolled engine and the engine after the control device or technique has been employed. In this situation, the engine's typical operating parameters, loading, and duty cycle shall be documented and repeated at each successive post-control source test to ensure that the engine is meeting the percent reduction limit. When representative source sampling prior to the application of an emissions control technology or technique is not available, the APCO may approve the use of a manufacturer's uncontrolled emissions information or source sampling from a similar, uncontrolled engine.

5.4 The owner of an internal combustion engine that uses percent emission reduction to comply with the NO<sub>x</sub> emission limits of Section 5.1 shall provide an accessible inlet and outlet on the external control device or the engine as appropriate for taking emission samples and as approved by the APCO.

5.5 California Reformulated Gasoline shall be used as the fuel for all gasoline-fired, spark-ignited internal combustion engines.

5.6 Monitoring Requirements

The owner of an engine (excluding those engines subject to Section 4.2 or Section 4.3 unless otherwise specified) subject to the requirements of this rule shall:

5.6.1 For each engine with a rated brake horsepower of 1,000 hp or greater and which is permitted to operate more than 2,000 hours per calendar year, or with an external emission control device, either install, operate, and maintain continuous monitoring equipment for NO<sub>x</sub>, CO, and oxygen, as identified in Rule 1080 (Stack Monitoring), or install, operate, and maintain APCO-approved alternate monitoring. The monitoring system may be a continuous emissions monitoring system (CEMS), a parametric emissions monitoring system (PEMS), or an alternative monitoring system approved by the APCO. APCO-approved alternate monitoring shall consist of one or more of the following:

- 5.6.1.1 Periodic NO<sub>x</sub> and CO emission concentrations,
  - 5.6.1.2 Engine exhaust oxygen concentration,
  - 5.6.1.3 Air-to-fuel ratio,
  - 5.6.1.4 Flow rate of reducing agents added to engine exhaust,
  - 5.6.1.5 Catalyst inlet and exhaust temperature,
  - 5.6.1.6 Catalyst inlet and exhaust oxygen concentration,
  - 5.6.1.7 Other operational characteristics.
- 5.6.2 For each engine not subject to Section 5.6.1, monitor operational characteristics recommended by the engine manufacturer or emission control system supplier, and approved by the APCO.
- 5.6.3 For each engine with an alternative monitoring system, submit to, and receive approval from the APCO, adequate verification of the alternative monitoring system's acceptability. This would include data demonstrating the systems accuracy under typical operating conditions for the specific application and any other information or data deemed necessary in assessing the acceptability of the alternative monitoring system.
- 5.6.4 For each engine with an APCO approved CEMS, operate the CEMS in compliance with the requirements of 40 Code of Federal Regulations (CFR) Part 51, 40 CFR Parts 60.7 and 60.13 (except subsection h), 40 CFR Appendix B (Performance Specifications), 40 CFR Appendix F (Quality Assurance Procedures), and applicable provisions of Rule 1080 (Stack Monitoring).
- 5.6.5 For each engine, have the data gathering and retrieval capabilities of an installed monitoring system described in Section 5.6 approved by the APCO.
- 5.6.6 For each engine, including an engine subject to Section 4.2, install and operate a nonresettable fuel meter and a nonresettable elapsed operating time meter. In lieu of installing a nonresettable fuel meter, the owner or operator may use an alternative device, method, or technique in determining monthly fuel consumption provided that the alternative is approved by the APCO. The owner or operator shall maintain these required meters in proper operating condition. The fuel meter shall be calibrated periodically per the recommendations of the manufacturer.
- 5.6.7 For each engine, implement the Inspection and Monitoring (I&M) plan submitted to and approved by the APCO pursuant to Section 6.5.
- 5.6.8 For each engine, collect data through the I&M plan in a form approved by the APCO.

5.6.9 For each engine, use a portable NOx analyzer to take NOx emission readings to verify compliance with the emission requirements of Section 5.1 or Section 8.2 during each calendar quarter in which a source test is not performed. All emission readings shall be taken with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate. The analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. All NOx emissions readings shall be reported to the APCO in a manner approved by the APCO. NOx emission readings taken pursuant to this section shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five (5) readings evenly spaced out over the 15 consecutive-minute period.

## 6.0 Administrative Requirements

### 6.1 Emission Control Plan

The owner of an engine subject to the requirements of this rule shall submit to the APCO an emission control plan of all actions to be taken to satisfy the emission requirements of Section 5.1 and the compliance schedules of Section 7.0.

6.1.1 Such emission control plan shall contain a list with the following for each permitted engine:

- 6.1.1.1 Permit-to-Operate number
- 6.1.1.2 Engine manufacturer
- 6.1.1.3 Model designation
- 6.1.1.4 Rated brake horsepower
- 6.1.1.5 Type of fuel and type of ignition
- 6.1.1.6 Combustion type: rich-burn or lean-burn
- 6.1.1.7 Total hours of operation in the previous one-year period, including typical daily operating schedule
- 6.1.1.8 Fuel consumption (cubic feet for gas or gallons for liquid) for the previous one-year period
- 6.1.1.9 Stack modifications to facilitate continuous in-stack monitoring and to facilitate source testing
- 6.1.1.10 Type of control to be applied, including in-stack monitoring specifications
- 6.1.1.11 Applicable emission limits
- 6.1.1.12 Documentation showing existing emissions of NOx, VOC, and CO, and
- 6.1.1.13 Date that the engine will be in full compliance with Rule 4702.



- 6.1.2 The emission control plan shall identify the type of emission control device or technique to be applied to each engine and a construction/removal schedule, or shall provide support documentation sufficient to demonstrate that the engine is in compliance with the emission requirements of this rule.
- 6.1.3 The emission control plan shall include support documentation for an exempt engine, pursuant to Section 6.2.3, and a letter of intent for an engine being permanently removed from service, pursuant to Section 7.5.

## 6.2 Recordkeeping

- 6.2.1 Except for engines subject to Section 4.0, the owner of an engine subject to the requirements of this rule shall maintain an engine operating log to demonstrate compliance with this rule. This information shall be retained for a period of at least five years, shall be readily available, and be made available to the APCO upon request. The engine operating log shall include, on a monthly basis, the following information:
  - 6.2.1.1 Total hours of operation,
  - 6.2.1.2 Type and quantity (cubic feet of gas or gallons of liquid) of fuel used,
  - 6.2.1.3 Maintenance or modifications performed,
  - 6.2.1.4 Monitoring data,
  - 6.2.1.5 Compliance source test results, and
  - 6.2.1.6 Any other information necessary to demonstrate compliance with this rule.
- 6.2.2 The data collected pursuant to the requirements of Section 5.6 shall be maintained for at least five years, shall be readily available, and made available to the APCO upon request.
- 6.2.3 An owner claiming an exemption under Section 4.2 or Section 4.3 shall maintain annual operating records. This information shall be retained for at least five years, shall be readily available, and submitted to the APCO upon request and at the end of each calendar year in a manner and form approved by the APCO. The records shall include, but are not limited to, the following:
  - 6.2.3.1 Total hours of operation,
  - 6.2.3.2 The type and quantity (cubic feet of gas or gallons of liquid) of fuel used,
  - 6.2.3.3 The purpose for operating the engine,
  - 6.2.3.4 For emergency standby engines, all hours of non-emergency and emergency operation shall be reported, and

6.2.3.5 Other support documentation necessary to demonstrate claim to the exemption.

### 6.3 Compliance Testing

The owner of an engine subject to the emission limits in Section 5.1 or the requirements of Section 8.2, shall:

6.3.1 Demonstrate compliance with applicable limits by the applicable date specified in Section 7.6 and at least once every 24 months thereafter, in accordance with the test methods in Section 6.4.

6.3.2 Conduct emissions source testing with the engine operating either at conditions representative of normal operations or conditions specified in the Permit-to-Operate. For emissions source testing performed pursuant to Section 6.3.1 for the purpose of determining compliance with an applicable standard or numerical limitation, the arithmetic average of three (3) 30-consecutive-minute test runs shall apply. If two (2) of three (3) runs are above an applicable limit, the test cannot be used to demonstrate compliance with an applicable limit. VOC shall be reported as methane. VOC, NO<sub>x</sub>, and CO concentrations shall be reported in ppmv, corrected to 15 percent oxygen. For engines that comply with a percent reduction limit in Table 1, the percent reduction of NO<sub>x</sub> emissions shall also be reported.

6.3.3 In addition to other information, the source test protocol shall describe which critical parameters will be measured and how the appropriate range for these parameters shall be established. The range for these parameters shall be incorporated into the I&M plan.

### 6.4 Test Methods

Compliance with the requirements of Section 5.0 shall be determined in accordance with the following test procedures or any other method approved by EPA and the APCO:

6.4.1 Oxides of nitrogen - EPA Method 7E, or ARB Method 100.

6.4.2 Carbon monoxide - EPA Method 10, or ARB Method 100.

6.4.3 Stack gas oxygen - EPA Method 3 or 3A, or ARB Method 100.

6.4.4 Volatile organic compounds - EPA Method 25A or 25B, or ARB Method 100.

6.4.5 Operating horsepower determination - any method approved by EPA and the APCO.

## 6.5 Inspection and Monitoring Plan

The owner of an engine subject to the emission limits in Section 5.1 or the requirements of Section 8.2, shall submit to the APCO for approval, an I&M plan that specifies all actions to be taken to satisfy the following requirements and the requirements of Section 5.6. The actions to be identified in the I&M plan shall include, but are not limited to, the following:

- 6.5.1 Procedures requiring the owner or operator to establish ranges for control equipment parameters, engine operating parameters, and engine exhaust oxygen concentrations that source testing has shown result in pollutant concentrations within the rule limits.
- 6.5.2 Procedures for monthly inspections as approved by the APCO. The applicable control equipment parameters and engine operating parameters will be inspected and monitored monthly in conformance with a regular inspection schedule listed in the I&M plan.
- 6.5.3 Procedures for the corrective actions on the noncompliant parameter(s) that the owner or operator will take when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO<sub>x</sub>, CO, VOC, or oxygen concentrations.
- 6.5.4 Procedures for the owner or operator to notify the APCO when an engine is found to be operating outside the acceptable range for control equipment parameters, engine operating parameters, and engine exhaust NO<sub>x</sub>, CO, VOC, or oxygen concentrations.
- 6.5.5 Procedures for preventive and corrective maintenance performed for the purpose of maintaining an engine in proper operating condition.
- 6.5.6 Procedures and a schedule for using a portable NO<sub>x</sub> analyzer to take NO<sub>x</sub> emission readings pursuant to Section 5.6.9.
- 6.5.7 Procedures for collecting and recording required data and other information in a form approved by the APCO including, but not limited to, data collected through the I&M plan and the monitoring systems described in Sections 5.6.1 and 5.6.2. Data collected through the I&M plan shall have retrieval capabilities as approved by the APCO.

6.5.8 Procedures for revising the I&M plan. The I&M plan shall be updated to reflect any change in operation. The I&M plan shall be updated prior to any planned change in operation. An engine owner that changes significant I&M plan elements must notify the District no later than seven days after the change and must submit an updated I&M plan to the APCO no later than 14 days after the change for approval. The date and time of the change to the I&M plan shall be recorded in the engine operating log. For new engines and modifications to existing engines, the I&M plan shall be submitted to and approved by the APCO prior to issuance of the Permit-to-Operate. The owner of an engine may request a change to the I&M plan at any time.

## 7.0 Compliance Schedules

- 7.1 The owner of an engine which becomes subject to the emission limits of this rule through loss of exemption shall not operate the subject engine, except as required for obtaining a new or modified Permit-to-Operate for the engine, until the owner demonstrates full compliance with the requirements of this rule.
- 7.2 The owner of an engine subject to the requirements of this rule shall submit to the APCO an emission control plan pursuant to Section 6.1 by June 1, 2004. The owner of an engine which is subject to the requirements of this rule and which is acquired after June 1, 2004 shall submit to the APCO an emission control plan pursuant to Section 6.1 with the ATC application for the engine.
- 7.3 The owner of an engine to be modified subject to the compliance schedule of Section 7.6 shall submit a complete application for an ATC for each engine by June 1, 2004, or at least 24 months before compliance with the emission limits in Section 5.1 is required pursuant to Section 7.6, whichever is later.
- 7.4 The owner of an engine subject to the requirements of this rule shall submit an I&M plan to the APCO by June 1, 2004, or at least 24 months before compliance with the emission limits in Section 5.1 is required pursuant to Section 7.6, whichever is later. The I&M plan shall be submitted with the Authority to Construct pursuant to complying with Section 7.6 as applicable. In lieu of submitting an I&M plan, the owner of an engine may comply with the submittal requirements of the I&M plan by including all information required in an I&M plan, pursuant to Section 6.5, in the ATC submitted pursuant to Section 7.3.
- 7.5 The owner of an engine who elects to permanently remove the engine from service shall comply with the following:
- 7.5.1 Submit a letter with the emission control plan stating the intent to permanently remove the engine from service; and

7.5.2 Permanently remove the engine from service and officially surrender the Permit-to-Operate by the applicable compliance date in Section 7.6.

7.6 The owner of an engine subject to the requirements of this rule shall not operate the engine unless the owner demonstrates and maintains the engine in compliance with the applicable requirements of this rule by the indicated dates:

Emission Limit Compliance Schedule 1

Quantity of Engines to be in Compliance at a Stationary Source	Compliance Date
a. 25% or more of the total number of engines at a stationary source on June 1, 2005	6/1/05
b. 62.5% or more of the total number of engines at a stationary source on June 1, 2006	6/1/06
c. 100% of the total number of engines at a stationary source on June 1, 2007	6/1/07

For the purposes of Section 7.6, the total number of engines at a stationary source on a specified date includes those engines subject to this rule pursuant to Section 2.0 and excludes any engines exempt from this rule pursuant to Section 4.1 or Section 4.4 on the specified date.

7.7 Unless otherwise specified, the owner of an engine subject to the requirements of this rule shall be in full compliance with this rule by the applicable compliance date pursuant to Section 7.6.

8.0 Alternative Emission Control Plan (AECp)

An owner may comply with the NOx emission requirements of Section 5.1 for a group of engines by meeting the requirements below. An owner that is subject to the requirements below shall also comply with all the applicable requirements of Sections 5.0, 6.0, and 7.0. An engine that is not subject to Section 5.1 is not eligible for inclusion in an AECp.

8.1 During any 7 (seven) consecutive calendar day period, the owner shall operate all engines in the AECp to achieve an actual aggregate NOx emission level that is not greater than 90 percent of the NOx emissions that would be obtained by controlling the engines to comply individually with the NOx limits in Section 5.1. The owner shall operate engines in the AECp such that

$$AE_{\text{Actual}} \leq 0.90 (AE_{\text{Limit}})$$

and shall notify the APCO within 24 hours of any violation of this section.

- 8.1.1 The actual aggregate NOx emissions ( $AE_{Actual}$ ) is the sum of the actual NOx emissions, over a 7 (seven) consecutive calendar day period, from all engines in the AECP which were actually operated during that period.  $AE_{Actual}$  shall be calculated as follows:

$$AE_{Actual} = \sum_i (EF_i)(F_i)(k_i)$$

where:

i identifies each engine in the AECP.

$EF_i$  is the NOx emission factor of the engine established pursuant to Section 8.2 and approved by the APCO.

$F_i$  is the actual total fuel used by the engine during the 7 (seven) consecutive calendar day period.

$k_i$  is a constant used to convert an engine's fuel use and NOx emission factor to the amount of NOx emitted.  $k_i$  is dependent on the engine and the pollutant emitted. Calculation of  $k_i$  shall be accomplished using 40 CFR Part 60, Appendix A, Method 19, or an equivalent method approved by EPA, ARB and the APCO.

- 8.1.2 The estimated aggregate NOx emissions limit ( $AE_{Limit}$ ) is the sum of the NOx emissions, over a 7 (seven) consecutive calendar day period, for the same engines in the AECP which were actually operated during the same period as considered in Section 8.1.1, calculated with the NOx limits of Section 5.1 and the actual fuel usage during that 7 (seven) consecutive calendar day period.  $AE_{Limit}$  shall be calculated as follows:

$$AE_{Limit} = \sum_i (EL_i)(F_i)(k_i)$$

where:

i identifies each engine in the AECP.

$EL_i$  is the NOx emission limit from Section 5.1 for each engine.

$F_i$  is the actual total fuel used by the engine during the 7 (seven) consecutive calendar day period.

$k_i$  is a constant used to convert an engine's fuel use and NOx emission limit to the amount of NOx emitted.  $k_i$  is dependent on the engine and

the pollutant emitted. Calculation of  $k_i$  shall be accomplished using 40 CFR Part 60, Appendix A, Method 19, or an equivalent method approved by EPA, ARB and the APCO.

- 8.1.3 Only engines in the AECF which were operated during the 7 (seven) consecutive calendar day period shall be included in the calculations of  $AE_{Limit}$  and  $AE_{Actual}$ .
- 8.1.4 The owner shall, at least one time each day the AECF is used, calculate and record the actual aggregate NO<sub>x</sub> emissions ( $AE_{Actual}$ ) and the aggregate NO<sub>x</sub> emission limit ( $AE_{Limit}$ ) for the preceding 7 (seven) consecutive calendar day period.
- 8.2 The owner shall establish a NO<sub>x</sub> emission factor limit for each engine. The established NO<sub>x</sub> emission factor of an engine shall be no less than the NO<sub>x</sub> emission factor of the engine from the most recent source test conducted pursuant to Section 6.3 and approved by the APCO. The owner shall not operate an AECF engine in such a manner that NO<sub>x</sub> emissions exceed the established NO<sub>x</sub> emission factor of the engine.
- 8.3 The owner shall submit the AECF to the APCO by June 1, 2004, or at least 24 months before compliance with the emission limits in Section 5.1 is required pursuant to Section 7.6, whichever is later. The AECF shall be submitted with the Authority-to-Construct pursuant to complying with Section 7.6 as applicable. The AECF shall:
  - 8.3.1 Not be implemented prior to APCO approval.
  - 8.3.2 Be enforceable on a daily basis by the District.
  - 8.3.3 Contain any information necessary to determine eligibility of the engines for alternative emission control, including, but not limited to:
    - 8.3.3.1 A list of engines subject to the AECF. All engines in an AECF shall be under the operational control of a single owner and shall be located at a single stationary source.
    - 8.3.3.2 The NO<sub>x</sub> emission factor established by the engine owner for each engine pursuant to Section 8.2.
    - 8.3.3.3 The estimated aggregate NO<sub>x</sub> emissions calculated according to Section 8.1.2.

- 8.3.4 Present the methodology for determining equivalency of actual NO<sub>x</sub> emissions under the proposed AECP as compared to the estimated NO<sub>x</sub> emissions allowed by this rule.
  - 8.3.5 Detail the method of recording and verifying daily compliance with the AECP.
  - 8.3.6 Demonstrate to the satisfaction of the APCO that the difference between the NO<sub>x</sub> emission limits of this rule and any lower actual NO<sub>x</sub> emissions will not be used to increase emissions from the same or another source.
  - 8.3.7 Demonstrate that the engines subject to the requirements of Section 5.1 are in compliance with or on an approved schedule for compliance with all applicable District rules.
- 8.4 The owner shall submit an updated or modified AECP for approval by the APCO prior to any of the following:
- 8.4.1 Modification of the engine(s) which would require an Authority-to-Construct.
  - 8.4.2 When new or amended rules are adopted which regulate the emissions from the engines.
  - 8.4.3 When the NO<sub>x</sub> emission factor established by the engine owner for an engine pursuant to Section 8.2 is modified.
- 8.5 In addition to the records kept pursuant to Section 6.2, the owner shall maintain records, on a daily basis, of the parameters needed to demonstrate compliance with the applicable NO<sub>x</sub> emission limits when operating under the AECP. These records shall be retained for at least five years, shall be readily available, and be made available to the APCO upon request. The records shall include, but are not limited to, the following for each engine unless otherwise indicated:
- 8.5.1 Total hours of operation.
  - 8.5.2 Type and quantity (cubic feet of gas or gallons of liquid) of fuel used.
  - 8.5.3 The actual NO<sub>x</sub> emissions limits to be included in the calculation of  $AE_{\text{Actual}}$  pursuant to Section 8.1.1.
  - 8.5.4 The actual aggregate NO<sub>x</sub> emissions ( $AE_{\text{Actual}}$ ) for all the engines in the AECP calculated pursuant to Section 8.1.1.



- 8.5.5 The estimated NO<sub>x</sub> emissions limits to be included in the calculation of  $AE_{Limit}$  pursuant to Section 8.1.2.
  - 8.5.6 The estimated aggregate NO<sub>x</sub> emissions ( $AE_{Limit}$ ) for all the engines in the AECF calculated pursuant to Section 8.1.2.
  - 8.5.7 The comparison of the actual aggregate NO<sub>x</sub> emissions ( $AE_{Actual}$ ) for all the engines in the AECF and 90 percent of the estimated aggregate NO<sub>x</sub> emissions ( $AE_{Limit}$ ) for all the engines in the AECF to demonstrate compliance with Section 8.1.
  - 8.5.8 Any other parameters needed to demonstrate daily compliance with the applicable NO<sub>x</sub> emission limits when operating under the AECF.
- 8.6 For the purpose of determining the quantity of engines in compliance pursuant to Section 7.6, an engine in an AECF shall not be considered to be in compliance until all engines in the AECF that have been designated to meet more stringent NO<sub>x</sub> emission factors pursuant to Section 8.2 are in compliance with the rule.

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