

**AIR POLLUTION CONTROL DISTRICT  
SAN DIEGO COUNTY**

**WORKSHOP REPORT**

**RULE 69.4 - STATIONARY RECIPROCATING INTERNAL  
COMBUSTION ENGINES**

A workshop notice was mailed to all known owners and/or operators of stationary reciprocating internal combustion engines in San Diego County. Notices were also mailed to all Economic Development Corporations and Chambers of Commerce in San Diego County, the U.S. Environmental Protection Agency (EPA), the California Air Resources Board (ARB), and other interested parties.

The workshop was held on July 25, 1994 and was attended by 40 people. Oral and written comments were received during and after the workshop from the affected industry and EPA. The comments and District responses are as follows:

**1. WORKSHOP COMMENT:**

Military tactical and deployable equipment should be exempt from the proposed rule. This equipment must conform to configurations of national military standards and cannot be modified unless all equipment interchangeable with it is also modified throughout the armed forces. Such modifications would also involve revising the technical manuals for all engines, retraining all engine maintenance personnel, and restocking all the spare parts stores and inventories throughout the armed services. All this would take considerable time, effort and money. In addition, a certain definable population of deployable equipment is used within San Diego County only for maintenance and training purposes, and otherwise operates fully outside the United States. If engines connected with such equipment are modified, they would be unusable in other parts of the country or abroad. Such practice would be contrary and detrimental to military readiness. More importantly, when this equipment is deployed, very often the equipment that is returned comes from a military base elsewhere, or is a new piece of equipment from a national warehouse.

**DISTRICT RESPONSE:**

The District agrees that equipment used solely for training and maintenance purposes in San Diego County and operated outside the county otherwise should not be subject to the requirements of Rule 69.4, particularly when such equipment is not necessary returned to San Diego County after deployment. Accordingly, the rule has been revised to provide an exemption for military tactical and deployable equipment provided that it operates less than 1,000 hours per year in San Diego County. A definition for such equipment has also been added to the rule.

**2. WORKSHOP COMMENT:**

Is the number of hours for exemptions in Subsection (b)(2) based on actual or permitted hours of engine operation?

**DISTRICT RESPONSE:**

The exemptions are based on actual hours of engine operation. In order to qualify for this exemption, a facility has to keep records as required by Subsections (e)(1) and (e)(2). Permits for engines that qualify for exemptions under Subsection (b)(2) will contain conditions that limit operations to not more than the hours specified in (b)(2).

**3. WORKSHOP COMMENT:**

What is the definition of a major stationary source of NOx emission?

**DISTRICT RESPONSE:**

A major source of NOx emissions is defined in the Federal Clean Air Act, and Subsection (c)(8) of the proposed rule. A major source of NOx emissions for a "severe" ozone non-attainment area (present classification of San Diego County) is a stationary source that emits or has a potential to emit 25 tons or more of NOx per year. If San Diego County is reclassified to a "serious" ozone non-attainment area by EPA, a major stationary source of NOx will be a source that emits or has the potential to emit 50 tons or more of NOx per year.

**4. WORKSHOP COMMENT:**

Would a designation of major source of NOx emissions be based on its potential to emit or its actual emissions?

**DISTRICT RESPONSE:**

The District will consider a facility to be a major source of NOx if its actual cumulative emissions from all emission units such as boilers, turbines and engines, in 1990 and in any year thereafter are equal to or greater than 25 tons (or 50 tons if the County is reclassified by EPA).

**5. WORKSHOP COMMENT:**

If a facility emitted more than 25 tons of NOx per year in 1990, but later reduced its emissions below the major source level threshold, would it be considered a non-major source?

**DISTRICT RESPONSE:**

No, it will still be considered a major source. EPA has determined that for the purposes of determination of RACT applicability, a source will be considered non-major if its potential to emit (actual or allowable) is less than 25 tons per year provided that all of the following conditions are met:

- a) The source has a federally enforceable permit conditions to permanently restrict its allowable emissions below the major source level; and
- b) The actual emissions have never exceeded the major source threshold since the 1990 emission inventory incorporated in the State Implementation Plan; and
- c) The emissions allowed under the permit or other enforceable document are not greater than emissions accounted for in the District's attainment demonstration.

However, the District is evaluating ways in which sources that have permanent, demonstrable and enforceable reductions in emissions can limit their potential to emit below major source levels. The mechanisms for doing this must be acceptable to EPA in order for the limits on potential to emit to be federally enforceable.

**6. WORKSHOP COMMENT:**

What is the status of the District's efforts for reclassification of San Diego County from "severe" to "serious" ozone non-attainment area?

**DISTRICT RESPONSE:**

The District has applied to EPA for the reclassification. It is expected that the decision will be made by October, 1994.

**7. WORKSHOP COMMENT:**

EPA recommends in its comments on the proposed draft of Rule 69.4 that the NOx emission limit for diesel engines should be 8.4 gm/bhp-hr. Where does this limit come from?

**DISTRICT RESPONSE:**

EPA comments refer to the average emission limits achieved for diesel engines in the South Coast and Ventura air districts where rules for such engines have existed since 1984. This emission standard was also proposed as a RACT limit by the Combustion Committee of the state Technical Review Group.

**8. WORKSHOP COMMENT:**

Some high performance diesel engines equipped with aftercooling and turbocharging have higher emission factors, between 9 and 9.5 gm/bhp-hr. A 4° ignition retard does not result in significant NOx emission reduction for these engines and sometimes even increases visible emissions.

**DISTRICT RESPONSE:**

For newer engines equipped with turbocharging and aftercooling, the proposed rule now provides an option to comply by reducing NOx emissions from an uncontrolled level by 25% instead of meeting a specified emission concentration limit.

**9. WORKSHOP COMMENT:**

What determines the uncontrolled NOx emission level of an engine?

**DISTRICT RESPONSE:**

The uncontrolled emission level for an engine is determined as the concentration of oxides of nitrogen (NOx), expressed in parts per million (volume) as nitrogen dioxide (NO<sub>2</sub>) at 15% of oxygen, or in grams of NOx per brake horsepower-hour, before the application of any NOx control technology. For rich-burn engines controlled by non-selective catalytic reduction (NSCR), the uncontrolled NOx emission level would be the one measured before the catalytic control device. For diesel engines, NOx emissions before any combustion modifications would be considered uncontrolled emissions. For lean-burn engines, the uncontrolled NOx emission level will have to be determined on a case-by-case basis.

**10. WORKSHOP COMMENT:**

The proposed revised standards present an engine owner or operator with a choice to comply either with the required NOx concentration (ppmv) or with a specified percent of NOx emission reduction. Would the most stringent standard be used for compliance purposes?

**DISTRICT RESPONSE:**

No. The engine would be in compliance with the rule if it meets either the NOx emission concentration standard or the NOx emission reduction percentage standard.

**11. WORKSHOP COMMENT:**

South Coast AQMD allows the catalyst emission reduction efficiency for rich-burn engines to decrease from 90% to 80% over time to allow for degradation of the catalyst. Will the District give a similar allowance for the catalyst to degrade over time?

**DISTRICT RESPONSE:**

No. The District's data show that fresh catalysts provide about 98% reduction efficiency and stabilize at about 90%. This will provide compliance with at least the NOx emission concentration limit of 50 ppmv. Currently, all permitted rich-burn engines in the District can meet this limit.

**12. WORKSHOP COMMENT:**

The proposed rule has NOx emission limits calculated at 15% excess oxygen. The permit conditions issued by the District specify NOx concentration at 3% excess oxygen. Would these permit conditions be revised?

**DISTRICT RESPONSE:**

Yes. After Rule 69.4 is adopted, permit conditions related to the operations of affected engines will be revised to reflect the rule's requirements.

**13. WORKSHOP COMMENT:**

Some military facilities have many identical diesel engines on site. Would the rule require an operator to demonstrate compliance for each engine separately?

**DISTRICT RESPONSE:**

The District expects that many of these engines will be exempt from the rule based on their usage (i.e., tactical and deployable). For such engines, only records required by Subsections (e)(1) and (e)(2) would be needed. For the remaining engines subject to the rule standards, initial compliance with the rule needs to be demonstrated separately for each engine.

**14. WORKSHOP COMMENT:**

Does the District have a standard recordkeeping form that lists all the information necessary to comply with the requirements of Section (e)?

**DISTRICT RESPONSE:**

Not at this time. However, the District will develop a standard form and provide it to affected facilities.

**15. WORKSHOP COMMENT:**

What standards are applicable to equipment operating on kerosene, or JP-5 fuel?

**DISTRICT RESPONSE:**

This equipment must comply with the same NOx emission standards as engines using diesel fuel. The proposed rule has been revised to reflect this.

**16. WORKSHOP COMMENT:**

It is impractical to keep monthly records for military equipment which may be in storage and inactive for nine months of the year. The wording "if operational" should be added to the recordkeeping requirement in Subsection (e) (5) so the engine parameters would not be measured while it is in storage.

**DISTRICT RESPONSE:**

Subsection (e)(5) requires operators to record only "operating parameters". If an engine is not operating for a calendar month, the words "not operated" will be sufficient for the record.

**17. WORKSHOP COMMENT:**

The monitoring requirements in the proposed rule will force industry to buy new equipment to measure the required parameters.

**DISTRICT RESPONSE:**

All rich-burn and lean-burn stationary engines which have District Permits to Operate are already required to record the information specified by the rule. The operating parameters for diesel engines can be measured with temperature and/or pressure gauges which should be readily available and not very expensive.

**18. WORKSHOP COMMENT:**

Subsection (f)(1) requires that District Test Method 20 be used to determine compliance with the rule standards. It is preferable to use EPA Test Method 20 since it costs less and more people are qualified to perform it.

**DISTRICT RESPONSE:**

Rule 69.4 has standards for both NO<sub>x</sub> and CO emissions. District Test Method 20 provides for the simultaneous determination of NO<sub>x</sub> and CO emissions from all combustion sources, including internal combustion engines. EPA Test Method 20 is designed to determine nitrogen oxides, sulfur dioxides, and diluent emissions only from stationary gas turbines. It does not measure CO emissions. Subsection (f)(1) has been revised to provide an option for using EPA Test Methods 7E and 10 for determining NO<sub>x</sub> and CO emissions, respectively.

**19. WORKSHOP COMMENT:**

It is difficult to measure the air to fuel ratio directly. However, the engine air to fuel ratio controller has a feedback control signal in millivolts. Would this signal voltage be an acceptable measure of the air to fuel ratio?

**DISTRICT RESPONSE:**

Yes. The feedback signal voltage can be the appropriate parameter to measure rich-burn and lean-burn air to fuel ratio.

**20. WORKSHOP COMMENT:**

Section(e)(5) requires measurement of several diesel engine operating parameters. Would all specified parameters need to be measured?

**DISTRICT RESPONSE:**

No. If a diesel engine is subject to the emission standards requirements of the proposed rule, only parameters necessary to demonstrate compliance with the rule and to ensure that the operating conditions of an engine have not changed need to be measured. The rule language provides flexibility to an engine operator. For example, for a 50 HP engine that does not have a turbocharger and is naturally aspirated, the inlet manifold temperature would be ambient air temperature and would not have to be recorded.

**21. WORKSHOP COMMENT:**

Subsection (e)(5) requires an operator to demonstrate continuous compliance. Does it require installing continuous emission monitors (CEM's)?

**DISTRICT RESPONSE:**

No. CEM's are not required by this rule. To demonstrate continuous compliance, an engine operator has to keep records required by the applicable provisions of Section (e).

**22. WRITTEN COMMENT:**

Subsections (e)(1)(v) and (e)(1)(vi) require an engine owner to keep a maintenance manual provided by the manufacturer and to keep records of annual engine maintenance. Requiring these records seems burdensome in view of the fact that there are no requirements for the facility to

perform maintenance in accordance with the manual. In addition, some facilities may not have the manufacturer's manual since some engines are very old.

**DISTRICT RESPONSE:**

The rule has been revised to require an engine owner perform maintenance according to the manufacturer's recommendation or another maintenance procedure, as approved by the Air Pollution Control Officer.

**23. WRITTEN COMMENT:**

Subsection (e)(5) is ambiguous because it does not list all required operating parameters to be recorded. It refers only to operating parameters such as exhaust temperature, engine-to-fuel ratio and inlet manifold temperature and pressure.

**DISTRICT RESPONSE:**

Operating parameters of diesel engines which affect their emissions and need to be recorded may vary on a case-by-case basis, depending on the type of combustion modifications a particular engine needs to comply with the rule. The parameters necessary to ensure compliance of each affected engine will be specified as conditions on the District permits to operate for those engines.

**24. WRITTEN COMMENT:**

Engines operating on digester gas are required by the rule to comply with the standards in Section (d). However, the heat content and production rate of the digester gas may vary with time which requires continual adjustment of the engine which will not always be tuned for minimum emissions. The rule should have a provision to specify that the emission limit is applicable at a specific design condition.

**DISTRICT RESPONSE:**

This suggestion cannot be incorporated into the proposed rule because it would require the District to specify design conditions for every such engine subject to the rule. However, the standards have been revised to provide the option to comply with the specified NOx emission concentration standard, or to reduce NOx emissions by 80% from an uncontrolled level. This will allow for the variability of the digester gas quality.

**25. EPA COMMENT:**

The emissions limits for Section (d) should be consistent with the RACT levels informally recommended by the Combustion Committee of the Technical Review Group (TRG). They are 50 ppmv or 90% reduction for rich-burn gaseous fueled engines, 125 ppmv or 80% reduction for lean-burn gaseous fueled engines, and 700 ppmv or 25% reduction for diesel engines .

**DISTRICT RESPONSE:**

The rule has been revised as suggested.

**26. EPA COMMENT:**

The definition for "brake horsepower output rating" in Section (c)(2) should include a reference to brake horse power rating as listed on the nameplate of the unit, regardless of any derating.

**DISTRICT RESPONSE:**

The District agrees. The rule has been revised as suggested. However, some diesel engines are very old and may not have a nameplate, or the nameplate may be unreadable. The rule, therefore, provides that this requirement is applicable only if the nameplate is available.

**27. EPA COMMENT**

The San Diego Air Pollution Control District Test Method 20 referenced in Section (f)(1) has not been approved by the EPA and must be submitted for approval.

**DISTRICT RESPONSE:**

The rule has been revised to include the option of using EPA Test Methods 7E and 10 instead of District Method 20. In addition, District Method 20 has already been submitted and verbally approved by EPA. The language referring to District Method 20 has been revised to include, "as approved by the EPA."

**28. EPA COMMENT:**

The compliance schedule in Section (g) should require all engines to be in compliance with the standards of Section (d) by May 31, 1995.

**DISTRICT RESPONSE:**

The rule has been revised as suggested.

JC:jl  
08/05/94



**AIR POLLUTION CONTROL DISTRICT  
COUNTY OF SAN DIEGO**

**PROPOSED NEW RULE 69.4**

**RULE 69.4      STATIONARY RECIPROCATING INTERNAL  
COMBUSTION ENGINES**

**(a)    APPLICABILITY**

Except as provided in Section (b), this rule shall apply to stationary internal combustion engines with a brake horsepower output rating of 50 bhp or greater located at a major stationary source of oxides of nitrogen (NOx). An engine subject to this rule shall not be subject to Rule 68.

**(b)    EXEMPTIONS**

(1) The provisions of this rule shall not apply to the following:

(i) Engines used exclusively in connection with a structure designed for and used as a dwelling for not more than four families.

(ii) Engines used exclusively in agricultural operations for the growing of crops or the raising of fowl or animals.

(2) The provisions of Section (d) of this rule shall not apply to the following:

(i) Any engine ~~Engines~~ which operates less than 200 hours per calendar year.

(ii) Any emergency ~~Emergency~~ standby engines operated either during emergency situations or for maintenance purposes, provided that the operations of the engine for maintenance purposes ~~do~~ does not exceed 52 hours per calendar year.

(iii) Any emergency ~~Emergency~~ standby engines at a nuclear generating stations subject to the requirements of the Nuclear Regulatory Commission, either during emergency situations or for maintenance purposes, provided that the operations of the engine for maintenance purposes do not exceed ~~200~~ 500 hours per calendar year.

(iv) Any engine used in conjunction with military tactical deployable equipment operated at military sites, provided that the operations of the engine does not exceed 1000 hours per calendar year.

An owner or operator of an engine who is claiming exemption pursuant to Subsection (b)(2) shall maintain records in accordance with Subsections (e)(1) and (e)(2).

**(c)    DEFINITIONS**

For the purposes of this rule, the following definitions shall apply:

(1) **"Add-on Control Equipment"** means any technology that is used to reduce oxides of nitrogen emissions from the exhaust gas stream of an engine and is installed downstream of the engine.

(2) **"Brake Horsepower Output Rating, bhp"** means the maximum continuous brake horsepower output rating as specified by the engine manufacturer and listed on the engine nameplate, if available, regardless of any derating.

(3) **"Emergency Standby Engine"** means an engine used exclusively in emergency situations to drive an electrical generator, an air compressor or a water pump.

(4) **"Emergency Situation"** means any one of the following:

(i) an unforeseen electrical power failure from the serving utility or of on-site electrical transmission equipment;

(ii) an unforeseen flood or fire, or a life-threatening situation.

(iii) Operation of emergency generators for Federal Aviation Administration licensed airports for the purpose of providing power in anticipation of a power failure due to severe storm activity shall be considered an emergency situation.

Emergency situation shall not include operation for purposes of supplying power for distribution to an electrical grid, operation for training purposes, or other foreseeable events.

(5) **"Existing Engine"** means an engine which commenced operation on or before (*date of adoption*).

(6) **"Fossil Derived Gaseous Fuel "** means gaseous fuel including, but not limited to, natural gas, methane, ethane, propane, butane, and gases stored as liquids at high pressure such as liquefied petroleum gas, and excluding waste derived gaseous fuel.

(7) **"Lean-Burn Engine"** means an engine that is designed to operate with an air to fuel ratio that is more than 1.1 times the stoichiometric air to fuel ratio.

(8) **"Major Stationary Source of NO<sub>x</sub>"** means a stationary source that emits or has the potential to emit 25 tons or more of NO<sub>x</sub> per year. If the San Diego County Air Pollution Control District is reclassified to a "serious" ozone non-attainment area by the federal Environmental Protection Agency, then a major stationary source of NO<sub>x</sub> will mean a stationary source that emits or has the potential to emit 50 tons or more of NO<sub>x</sub> per year.

(9) **"Military Tactical Deployable Equipment"** means equipment operated by the United States armed forces which is designed specifically for military use in an off-road, dense terrain and/or hostile environment or on board military combat vessels and is capable of being moved from one location to another. This equipment requires the ability to perform in a uniform manner with a minimum amount of maintenance which has been standardized throughout the United States military and/or NATO forces.

(9) (10) **"New Engine"** means an engine which commenced operation after (*date of adoption*).

~~(10)~~ (11) **"Portable Emissions Unit"** means ~~the same as defined in Rule 20.1 an~~ emission unit which is designed and equipped to be easily movable and, as installed, easily capable of being moved from one stationary source to another, as determined by the Air Pollution Control Officer. Portable emission units are periodically moved and may not be located more than 180 days at any one stationary source within any consecutive 12-month period. Days when portable emission units are stored in a designated holding or storage area shall not be counted towards the 180-day limit, provided the emission unit was not operated on that calendar day except for maintenance and was in the designated holding area the entire calendar day.

~~(11)~~ (12) **"Rich-Burn Engine"** means an engine that is designed to operate with an air to fuel ratio less than or equal to 1.1 times the stoichiometric air to fuel ratio.

~~(12)~~ (13) **"Stationary Internal Combustion Engine" or "Engine"** means a spark or compression ignited, reciprocating internal combustion engine which is not a portable emissions unit.

~~(13)~~ (14) **"Stationary Source"** means the same as is defined in Rule 20.1.

~~(14)~~ (15) **"Stoichiometric Air to Fuel Ratio"** means the chemically balanced air to fuel ratio at which all fuel and all oxygen in the air and fuel mixture are theoretically consumed by combustion.

~~(15)~~ (16) **"Waste Derived Gaseous Fuel "** means gaseous fuel including, but not limited to, sewage sludge digester gas and landfill gas.

**(d) STANDARDS**

(1) A person shall not operate a stationary internal combustion engine subject to this rule unless its:

(i) The emissions of oxides of nitrogen (NOx), calculated in parts per million by volume (ppmv) as nitrogen dioxide at 15% oxygen on a dry basis, are not greater than the following:

<u>Engine Category</u>	<u>Concentration of NOx (ppmv)</u>
Rich-burn engines using exclusively fossil derived gaseous fuel or gasoline	70 <u>50</u>
Lean-burn engines using exclusively fossil derived gaseous fuel	140 <u>125</u>
Engines using waste derived gaseous fuel	140 <u>125</u>
Engines using diesel <u>or kerosene</u> fuel	750 <u>700</u>

or

(ii) Uncontrolled NOx emissions from such engine are reduced by not less than the following:

<u>Engine Category</u>	<u>Percent Reduction</u>
<u>Rich-burn engines using exclusively fossil derived gaseous fuel or gasoline</u>	<u>90</u>
<u>Lean-burn engines using exclusively fossil derived gaseous fuel</u>	<u>80</u>
<u>Engines using waste derived gaseous fuel</u>	<u>80</u>
<u>Engines using diesel or kerosene fuel</u>	<u>25</u>

(2) For all engines subject to this rule, emissions of carbon monoxide, calculated in parts per million by volume (ppmv) at 15% oxygen on a dry basis, shall not exceed 4500 ppmv.

(3) An owner or operator of an engine subject to this rule shall conduct annual maintenance of the engine as recommended by the engine manufacturer or as specified by any other maintenance procedure approved in writing by the Air Pollution Control Officer.

**(e) MONITORING AND RECORDKEEPING REQUIREMENTS**

(1) An owner or operator of an engine subject to this rule shall keep the following records. The records required by this section shall be kept on site for at least the same period of time as the engines to which the records apply are located at the site:

- (i) engine manufacturer name and model number;
- (ii) brake horsepower output rating;
- (iii) combustion method (i.e. rich-burn or lean-burn);
- (iv) fuel type;
- (v) a manual of recommended maintenance as provided by the engine manufacturer, or other maintenance procedure as approved in writing by the Air Pollution Control Officer; and
- (vi) records of annual engine maintenance including dates of maintenance performed.

(2) In addition to the records required by Subsection (e)(1), an owner or operator of an engine exempt from the requirements of Section (d) shall maintain an operating log containing, at a minimum, the following:

- (i) dates and times of engine operation indicating, if applicable, whether the operation was during emergency situations or for maintenance purposes; and

(ii) total cumulative annual hours of operation.

(3) In addition to the records required by Subsection (e)(1), an owner or operator of a rich-burn engine subject to the requirements of Section (d) using add-on control equipment shall keep the following monthly records:

- (i) temperature of the inlet and outlet of the control device, and
- (ii) engine air-to-fuel ratio, and
- (iii) engine inlet manifold temperature and pressure.

(4) In addition to the records required by Subsection (e)(1), an owner or operator of a lean-burn engines using exclusively gaseous fuel subject to the requirements of Section (d) shall also keep the following monthly records:

- (i) engine air-to-fuel ratio and automatic air-to-fuel ratio control signal voltage, and
- (ii) engine exhaust temperature, and
- (iii) engine inlet manifold temperature and pressure.

(5) In addition to the records required by Subsection (e)(1), an owner or operator of an engine using diesel fuel subject to the requirements of Section (d) shall also keep monthly records of operating parameters that are necessary to demonstrate continuous compliance, such as:

- (i) engine air-to-fuel ratio;
- (ii) engine exhaust temperature; and
- (iii) engine inlet manifold temperature and pressure.

Except as otherwise specified in this rule, all All records required by Section (e) shall be retained on site for at least three years and made available to the District upon request.

#### (f) TEST METHODS

(1) To determine compliance with Section (d), measurement of oxides of nitrogen, carbon monoxide, and stack-gas oxygen content shall be conducted in accordance with ~~San Diego Air Pollution Control District Method 20~~ ARB Test Method 100 as approved by the U.S. Environmental Protection Agency (EPA) and a source test protocol approved in writing by the Air Pollution Control Officer.

(2) The averaging period to calculate NOx and carbon monoxide emissions concentrations and to determine compliance shall be at least thirty minutes and not more than 60 minutes.

(3) Emissions source testing, if applicable, shall be performed at no less than 80 percent of the brake horsepower output rating. If an owner or operator of an existing engine demonstrates to the satisfaction of the Air Pollution Control Officer that the engine cannot operate at these conditions, then emissions source testing shall be performed at the highest achievable continuous horsepower rating.

**(g) COMPLIANCE SCHEDULE**

The owner or operator of an engine subject to the requirements of Section (d) of this rule shall meet the following increments of progress:

(1) For an existing engine which does not need modification and/or add-on control equipment, submit documentation showing that the engine is in compliance with all applicable rule requirements not later than ~~(12 months after date of adoption)~~ May 31, 1995.

(2) For an existing engine which requires modification and/or add-on control equipment:

(i) By ~~(four months after date of adoption)~~, submit to the Air Pollution Control Officer an application for Authority to Construct and Permit to Operate a modified engine or add-on control equipment as necessary to comply with the applicable requirements of Section (d).

(ii) By ~~(eight months after date of adoption)~~ May 31, 1995, modify the engine or install add-on control equipment as necessary to comply with the applicable requirements of Section (d).

(3) For a new engine, comply with the applicable requirements of Section (d) upon installation and startup.