

6/30/72

RULE 101 Title These rules and regulations shall be known as
the Rules and Regulations of the Kern County Air Pollution Control
District.

u/10/76

RULE 103.1 Inspection of Public Records The Air Pollution Control Officer shall within ten (10) working days make available records requested. If, for good cause, the information cannot be made available within the ten (10) working days, the Air Pollution Control Officer shall notify the requesting person the reasons for the delay and when the information will be available.

Air Pollution Control Officer may require the requests for public records to be specific and in sufficient detail so that the information may be readily identified.

11/10/76

Rule 103 Confidential Information All information, analyses, plans, or specifications that disclose the nature, extent, quantity, or degree of air contaminants or other pollution which any article, machine, equipment, or other contrivance will produce, which any air pollution control district or any other state or local agency or district requires any applicant to provide before such applicant builds, erects, alters, replaces, operates, sells, rents, or uses such article, machine, equipment, or other contrivance, are public records.

All air and other pollution monitoring data, including data compiled from stationary sources, are public records.

Trade secrets are not public records under this rule. Trade secrets may include, but are not limited to, any formula, plan, pattern, process, tool, mechanism, compound, procedure, production data, or compilation of information which is not patented, which is known only to certain individuals within a commercial concern who are using it to fabricate, produce, or compound an article of trade or a service having commercial value and which gives its user an opportunity to obtain a business advantage over competitors who do not know or use it.

All air pollution emission data, including those emission data which constitute trade secrets, as defined in the above paragraph, are public records. Data used to calculate emission data are not emission data for the purpose of this subdivision and which constitute trade secrets and which are used to calculate emission data are not public records.

Any person furnishing any records may label as "trade secret" any part of those records which are entitled to confidentiality. Written justification for the "trade secret" designation shall be furnished with the records so designated and the designation shall not be a public record. The justification shall be as detailed as possible without disclosing the trade secret; the person may submit additional information to support the justification, which information, upon request, will be kept confidential in the same manner as the record sought to be protected.

Upon the receipt of an Application for "Confidential" Classification of Source Data the Air Pollution Control Officer shall, within ten (10) working days, notify the applicant of his ruling. In cases of rejection, the Air Pollution Control Officer promptly notify the person making the justification, in writing, that the records in question shall, within twenty-one (21) days be subject to public inspection unless justification is received and accepted.

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RULE 106 Land Use As part of his responsibility to protect the public health and property from the damaging effects of air pollution it shall be the duty of the air pollution control officer to review and advise the appropriate planning authorities within the district on all new construction or changes in land use which the air pollution control officer believes could become a source of air pollution problems.

1/2/79
RULE 111 Equipment Breakdown

a. An occurrence which constitutes a breakdown condition, and which persists only until the end of the production run or 24-hours, whichever is sooner (except for continuous monitoring equipment, for which the period shall be ninety-six (96) hours), shall constitute a violation of any applicable emission limitation or restriction prescribed by these rules and regulations; however, no enforcement action may be taken provided that the owner or operator demonstrates to the air pollution control officer that a breakdown condition exists and the following requirements are met:

1. The owner or operator submits the notification required by subparagraph c.1.; and
2. The owner or operator immediately undertakes appropriate corrective measures and comes into compliance.
3. The air pollution control officer determines that the attainment or maintenance of applicable ambient air quality standards will not be endangered.

c. Breakdown Procedures

1. The owner or operator shall notify the air pollution control officer of any occurrence which constitutes a breakdown condition; such notification shall identify the time, specific location, equipment involved, and (to the extent known) the cause(s) of the occurrence, and shall be given as soon as reasonably possible, but no later than two (2) hours after its detection.
 2. The air pollution control officer shall establish written procedures and guidelines, including appropriate forms for logging of initial reports, investigation, and enforcement follow-up, to ensure that all reported breakdown occurrences are handled uniformly to final disposition.
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3. Upon receipt of notification pursuant to subparagraph b.1. the air pollution control officer shall promptly investigate and determine whether the occurrence constitutes a breakdown condition. If the air pollution control officer determines that the occurrence does not constitute a breakdown condition, the air pollution control officer may take appropriate enforcement action, including, but not limited to seeking fines, an abatement order, or an injunction against further operation.

d. Reporting Requirements

Within 10 days after a breakdown occurrence has been corrected, the owner or operator shall submit a written report to the air pollution control officer which includes:

1. A statement that the occurrence has been corrected, together with the date of correction and proof of compliance;
2. a specific statement of the reasons(s) or cause(s) from the occurrence sufficient to enable the air pollution control officer to determine whether the occurrence was a breakdown condition.
3. a description of the corrective measures undertaken and/or to be undertaken to avoid such an occurrence in the future (the air pollution control officer may, at the request of the owner or operator, for good cause, extend up to 30 days the deadline for submitting the description required by this subparagraph);
4. an estimate of the emissions caused by the occurrence; and
5. pictures of the equipment or controls which failed, if available.

e. Burden of Proof

The burden shall be on the owner or operator of the source to provide sufficient information to demonstrate that a breakdown did occur. If the owner or operator fails to provide sufficient information, the air pollution control officer shall undertake appropriate enforcement action;

f. Failure to Comply with Reporting Requirements

Any failure to comply, or comply in a timely manner, with the reporting requirements established in subparagraphs c.1. and d.1. through d.5. of this rule shall constitute a separate violation of this rule.

g. False Claiming of Breakdown Occurrence

It shall constitute a separate violation of this rule for any person to file with the air pollution control officer a report which falsely, or without probable cause, claims that an occurrence is a breakdown occurrence.

h. Hearing Board Standards and Guidelines

The hearing board shall adopt standards and guidelines consistent with this rule to assist the chairperson or other designated member(s) of the hearing board in determining whether to grant or deny an emergency variance, and to assist the air pollution control officer in the enforcement of this rule.

i. Definition

For the purposes of this rule, a breakdown condition means an unforeseeable failure or malfunction of 1) any air pollution control equipment, or related operating equipment, which causes a violation of any emission limitation or restriction prescribed by these rules and regulations, or by State law, or 2) any in-stack continuous monitoring equipment, where such failure or malfunction

1. is not the result of neglect or disregard of any air pollution control law or rule or regulation;
2. is not intentional or the result of negligence;
3. is not the result of improper maintenance;
4. does not constitute a nuisance;
5. is not a recurrent breakdown of the same equipment.

RULE 202.1 Experimental Research Operations The Control Officer may exempt from the requirements of Regulation II experimental research operations if the following requirements are met. Failure to satisfy any of these requirements will result in the revocation of an exemption and require compliance with the requirements of Regulation II.

- a. The purpose of the operation is to permit investigation, experimentation or research to advance the state of knowledge or the state of art of a particular control technology or industrial process;
- b. The Control Officer is notified, in writing, of the purpose, goals and objectives of the project, measures to be taken to minimize the emission of air contaminants, the proposed installation date, the planned startup date, the expected duration of the test and test schedules;
- c. The cumulative total days of operation will not exceed 180. If the applicant intends to continue operation of the technology or process for more than 180 days, a compliance schedule for obtaining necessary permits under Regulation II shall be established by the Control Officer;
- d. Official test results (if the project involves air pollution control devices) are submitted to the District, in writing and in final form, no more than sixty (60) days after each test sequence is complete;
- e. The Control Officer has granted prior written approval.

For the purposes of this rule, "experimental research operations" include any air pollution control device or technology or any industrial process or technology which is a) innovative, b) not in common use for a particular process, or c) not readily available from a commercial supplier.

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RULE 205 Cancellation of Applications

- a. An authority to construct shall expire and the application shall be cancelled two years from the date of issuance of the authority to construct, *unless it is renewed.*
- b. An application for a permit to operate shall be cancelled two years from the date of filing of the application, *unless it is renewed.*

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FILE 207 Provision of Sampling and Testing Facilities. A person operating or using any equipment for which these rules require a permit shall provide and maintain such sampling and testing facilities as specified in the permit.

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RULE 214 Existing Sources Existing sources, where control equipment has been installed, that were in compliance and sources that are on a compliance schedule approved by the control district, on the effective date of Rule 201, shall be issued a conditional permit to operate. The conditional permit to operate will not be valid if there is a significant change in the process or significant increase in production.

Existing sources, requiring the installation of control equipment, shall be issued a conditional permit to operate provided that an acceptable time for compliance is filed with the control officer. The time for compliance shall include each of the following times: time for engineering, time for procurement, time for fabrication, and time for installation and adjustment. The control officer may require such periodic reports on each phase of the progress toward compliance. Failure at any phase to make reasonable progress toward completion of such installations as are required for final compliance shall be deemed an unreasonable delay in compliance and is subject to revocation of the conditional permit to operate.

7/19/74

RULE 401 Visible Emissions A person shall not discharge into the atmosphere, from any single source of emission whatsoever, any air contaminant for a period or periods aggregating more than 3 minutes in any one hour which is:

- a. As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines
- b. Of such opacity as to obscure an observer's view to a degree equal to or greater than does smoke described in subsection (a) of this Rule.

Rules 401 (a) and 401 (b) shall not apply if it is shown by the owner or operator of the emission source that the emission source was, at the time of violation of Rules 401 (a) and 401 (b), in compliance with other applicable emission standards of Regulation IV.

~~This amendment shall be effective on the date of its adoption for any source of emission not then completed and put into service. As to all other sources of emission this amendment shall be effective on January 1, 1974.~~

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RULE 402 Exemptions The provisions of Rule 401 do not apply to: _____

- a. Smoke from fires set by or permitted by any public officer, if such fire is set or permission given in the performance of the official duty of such officer, and such fire in the opinion of such officer is necessary:
 1. For the purpose of the prevention of a fire hazard which cannot be abated by any other means, or
 2. For the instruction of public employees in the methods of fighting fire.
- b. Smoke from fires set pursuant to permit on property used for industrial purposes for the purpose of instruction of employees in methods of fighting fire.
- c. Agricultural operations in the growing of crops or raising of fowl or animals.
- d. The use of an orchard or citrus grove heater which does not produce uncondensed solid carbonaceous matter at a rate in excess of one (1) gram per minute.
- e. The use of other equipment in agricultural operations in the growing of crops, or the raising of fowl or animals.

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RULE 403 Wet Flumes Where the presence of uncombined water is the only reason for the failure of an emission to meet the limitation of Rule 401, that rule shall not apply. The burden of proof which establishes the application of this rule shall be upon the person seeking to come within its provisions.

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RULE 404.1 Particulate Matter Concentration - Desert Basin A person shall not discharge into the atmosphere from any single source operation, in service on the date this rule is adopted, particulate matter in excess of 0.2 grains per cubic foot of gas at standard conditions.

A person shall not discharge into the atmosphere from any single source operation, the construction or modification of which commenced after the adoption of this rule, particulate matter in excess of 0.1 grains per cubic foot of gas at standard conditions.

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RULE 407.1 Disposal of Solid and Liquid Waste A person shall not discharge into the atmosphere from any incinerator or other equipment used to dispose of combustible refuse by burning, particulate matter in excess of 0.1 grain per cubic foot of gas calculated to 12 per cent of carbon dioxide (CO_2) at standard conditions. Any carbon dioxide (CO_2) produced by combustion of any liquid or gaseous fuels shall be excluded from the calculation to 12 per cent of carbon dioxide (CO_2).

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RULE 407 Sulfur Compounds A person shall not discharge into the atmosphere sulfur compounds, which would exist as a liquid or gas at standard conditions, exceeding in concentration at the point of discharge: 0.2 percent by volume calculated as sulfur dioxide (SO₂).

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RULE 419 Nuisance A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.

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RULE 420 Exception The provisions of Rule 419 do not apply to odors emanating from agricultural operations in the growing of crops or raising of fowl or animals.

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RULE 425.2 Boilers, Steam Generators, and Process Heaters (Oxides of Nitrogen) -

Adopted 10/13/94, Amended 4/6/95

I. Purpose

The purpose of this Rule is to limit oxides of nitrogen (NOx) emissions from boilers, steam generators, and process heaters to levels consistent with Reasonably Available Control Technology (RACT) to satisfy California Health and Safety Code Section 40918(b) and 1990 Federal Clean Air Act Amendments, Section 182(f). Carbon monoxide emissions are also limited to insure efficient combustion at reduced NOx levels.

II. Applicability

This Rule shall apply, as specified, to any boiler, steam generator or process heater with rated heat input of 5 million Btu per hour or more and fired with gaseous and/or liquid fuels.

III. Definitions

- A. Annual Heat Input - total heat released (therms) by fuel(s) burned in a unit during a calendar year as determined from higher heating value and cumulative annual fuel(s) usage.
- B. Boiler or Steam Generator - any external combustion unit fired with liquid and/or gaseous fuel used to produce hot water or steam, but not including gas turbine engine exhaust gas heat recovery systems.
- C. British Thermal Unit (Btu) - amount of heat required to raise temperature of one pound of water from 59°F to 60°F at one atmosphere.
- D. Gaseous Fuel - any fuel existing as gas at standard conditions.
- E. Heat Input - total heat released (Btu's) by fuel(s) burned in a unit as determined from higher heating value, not including sensible heat of incoming combustion air and fuel(s).
- F. Higher Heating Value (HHV) - total heat released per mass of fuel burned (Btu's per pound), when fuel and dry air at standard conditions undergo complete combustion and all resulting products are brought to standard conditions.
- G. Liquid Fuel - any fuel, including distillate and residual oil, existing as liquid at standard conditions.
- H. Natural gas curtailment - loss of natural gas supply due to action of PUC - regulated supplier. For Section V curtailment limit to apply, curtailment must not exceed 168 cumulative hours of operation per calendar year, excluding equipment testing not to exceed 48 hours per calendar year.

- I. Oxides of Nitrogen (NOx) - total nitrogen oxides (expressed as NO₂).
- J. Process Heater - any external combustion unit fired with liquid and/or gaseous fuel used to transfer heat from combustion gases to liquid process streams.
- K. Reasonably Available Control Technology (RACT) - lowest emission limitation a particular source is capable of meeting by application of control technology reasonably available considering technological and economic feasibility.
- L. Rated Heat Input - heat input capacity (Btu's/hr) specified on nameplate of unit or by manufacturer for that model number, or as limited by District permit.
- M. Standard Conditions - as defined in Rule 102, Subsection DD.
- N. Therm - 100,000 British thermal units (Btu's).
- O. Unit - any boiler, steam generator or process heater as defined in this Rule.

IV. **Exemption**

This Rule shall not apply to any unit with rated heat input less than 5 million Btu's per hour.

V. **Requirements**

- A. An owner/operator of any unit subject to this Rule with annual heat input of 90,000 therms or more during one or more of the three preceding years of operation shall comply with following applicable NOx emission limit(s):

	Gaseous Fuel	Liquid Fuel
During Normal Operation	70 ppmv, or 0.09lb/MMBtu	115 ppmv, or 0.15 lb/MMBtu
During Natural Gas Curtailment	----	150 ppmv, or 0.19 lb/MMBtu

For units subject to this Subsection, carbon monoxide (CO) emissions shall not exceed 400 ppmv.

NOx emission limit for any unit fired simultaneously with gaseous and liquid fuels shall be heat input-weighted average of applicable limits. Calculations shall be performed as prescribed in Section VIII.

NOx and CO emission limits in ppmv are referenced at dry stack gas conditions, adjusted to 3.00 percent by volume stack gas oxygen in accordance with Section VIII., and averaged over 15 consecutive minutes from no less than 5 data sets, recorded from sampling of no more than 3 minutes.

B. An owner/operator of any unit subject to this Rule with annual heat input rate of 90,000 therms or more shall comply, until November 30, 1997, and any unit with annual heat input rate of less than 90,000 therms shall comply with one of the following NOx minimization procedures:

1. Tune each unit at least once per year in accordance with Section IX.;
2. Operate each unit in manner maintaining stack gas oxygen at no more than 3.00 percent by volume on dry basis; or
3. Operate each unit with automatic stack gas oxygen trim system set at 3.00 (± 0.15) percent by volume on dry basis.

C. Monitoring Requirements

1. An owner/operator of any unit simultaneously firing a combination of different fuels shall install and maintain totalizing mass or volumetric flow rate meters in each fuel line.
2. An owner/operator of any unit equipped with equipment intended to reduce or control NOx shall install and maintain appropriate provisions to monitor operational parameters of unit and/or NOx control system that correlate to NOx emissions.

D. Compliance Demonstration

1. An owner/operator of any unit subject to Subsection V.A. shall have option of complying with either concentration (ppmv) emission limits or heat input basis (lb/MMBtu) emission limits as specified in Subsection V.A. All compliance demonstrations shall be performed using applicable test method(s) specified in Subsection VI.B. and methods selected to demonstrate compliance shall be specified in Emission Control Plan required by Subsection VI.D.
2. All emission measurements shall be made with unit operating at conditions as close as physically possible to maximum firing rate allowed by KCAPCD Permit to Operate.

VI. Administrative Requirements

A. Recordkeeping and Reporting

1. An owner/operator of any unit subject to this Rule or limited by permit condition to firing less than 5 million Btu's/hr shall monitor and record HHV and cumulative annual use of each fuel.
2. An owner/operator of any unit operated under natural gas curtailment limit of Subsection V.A. shall monitor and record cumulative annual hours of operation on liquid fuel during curtailment and during testing.
3. An owner/operator of any identical units wishing to limit emissions testing to one unit per group of units pursuant to Subsection VI.C. shall establish correlation of NOx emissions and key operating parameters and keep records of these data for each affected unit.
4. Records shall be maintained for at least two calendar years on site and shall be made readily available to District personnel.
5. Compliance test data and results collected to satisfy Subsection VI.C. shall be submitted to District within 60 days of collection.

B. Test Methods

1. Fuel HHV shall be certified by third party fuel supplier or determined by:
 - a. ASTM D 240-87 or D 2382-88 for liquid fuels; and
 - b. ASTM D 1826-88 or D 1945-81 in conjunction with ASTM D 3588-89 for gaseous fuels.
2. Oxides of nitrogen (ppmv) - EPA Method 7E, or CARB Method 100.
3. Carbon monoxide (ppmv) - EPA Method 10, or CARB Method 100.
4. Stack gas oxygen - EPA Method 3 or 3A, or CARB Method 100.
5. NOx emission rate (heat input basis) - EPA Method 19, or CARB Method 100 and data from fuel flow meter.
6. Stack gas velocity - EPA Method 2.
7. Stack gas moisture content - EPA Method 4.

C. Compliance Testing

1. An owner/operator of any unit subject to requirements of Subsection V.A. shall be tested to determine compliance with applicable requirements not

less than once every 12 months. An owner/operator of gaseous fuel-fired units demonstrating compliance for two consecutive years can, if desired, demonstrate compliance once every thirty-six months.

2. An owner/operator of any unit subject to Subsection V.B.2. shall sample and record stack gas oxygen content at least monthly.
3. Test results from an individual unit may be used for other units at the same location provided manufacturer, model number, rated capacity, fuel type, and emission control provisions are identical and key operating parameters such as stack gas oxygen, fuel consumption, etc. are monitored and established to correlate with NOx emissions from unit tested.

D. **Emission Control Plan**

An owner/operator of any unit subject to this Rule shall submit to Control Officer an Emission Control Plan including:

1. List of units subject to Rule, including rated heat inputs, anticipated annual heat input, applicable Section V. requirements, and control option chosen, if applicable;
2. Description of actions to be taken to satisfy requirements of Section V. Such plan shall identify actions to be taken to comply, including any type of emissions control to be applied to each unit and construction schedule, or shall include test results to demonstrate unit already complies with applicable requirements; and
3. Specification of proposed test methods.

VII. **Compliance Schedule**

- A. An owner/operator of any unit subject to Section V. shall comply with following schedule:
 1. By March 1, 1995, submit to Control Officer an Emission Control Plan pursuant to Subsection VI.D., and a complete application for Authority to Construct, if necessary;
 2. By May 31, 1995 demonstrate full compliance with Subsection V.B.; and
 3. By November 30, 1997 demonstrate full compliance with all additional and applicable provisions of this Rule.
- B. An owner/operator of any unit becoming subject to requirements of Subsection V.A. by exceeding annual heat input exemption threshold shall comply with following increments of progress:
 1. On or before December 31st of calendar year immediately following year

annual heat input threshold was exceeded, submit an Emission Control Plan containing information prescribed in Subsection VI.D.; and

- 2. No later than three calendar years following submission of Emission Control Plan, demonstrate final compliance with all applicable standards and requirements of this Rule.

VIII. Calculations

- A. All ppmv emission limits specified in Section V.A. are referenced at dry stack gas conditions and 3.00 percent by volume stack gas oxygen. Emission concentrations shall be corrected to 3.00 percent oxygen as follows:

$$[\text{ppmvNOx}]_{\text{corrected}} = \frac{17.95\%}{20.95\% - [\%O_2]_{\text{measured}}} \times [\text{ppmvNOx}]_{\text{measured}}$$

$$[\text{ppmCO}]_{\text{corrected}} = \frac{17.95\%}{20.95\% - [\%O_2]_{\text{measured}}} \times [\text{ppmCO}]_{\text{measured}}$$

- B. All lb/MMBtu NOx emission rates shall be calculated as pounds of nitrogen dioxide per million Btu's of heat input (HHV).
- C. Heat input-weighted average NOx emission limit for combination of natural gas and liquid fuel shall be calculated as follows:

$$\text{NOx Emission Limit} = \frac{(70\text{ppmv} \times X) + (115\text{ppmv} \times Y)}{X + Y}$$

Where X = heat input from gaseous fuel.
 Y = heat input from liquid fuel.

IX. NOx Minimization Tuning Procedures

- A. Purpose

The purpose of this procedure is to provide a reasonable, cost-effective method to minimize NOx emissions from smaller, or low-fire/low use-rate combustion units subject to this Rule. These procedures not only minimize NOx emissions, but also result in reduced operating costs.

- B. Equipment Tuning Procedure¹ for Mechanical Draft Boilers, Steam Generators, and Process Heaters

Nothing in this Tuning Procedure shall be construed to require any act or omission that would result in unsafe conditions or would be in violation of any regulation or requirement established by Factory Mutual, Industrial Risk Insurers,

1. This tuning procedure is based on a tune-up procedure developed by KVB, Inc. for EPA.

National Fire Prevention Association, California Department of Industrial Relations (Occupational Safety and Health Division), Federal Occupational Safety and Health Administration, or other relevant regulations and requirements.

1. Operate the unit at the firing rate most typical of normal operation. If the unit experiences significant load variations during normal operation, operate it at its average firing rate.
2. At this firing rate, record stack gas temperature, oxygen concentration, and CO concentration (for gaseous fuels) or smoke spot number¹ (for liquid fuels), and observe flame conditions after unit operation stabilizes at the firing rate selected.

If the excess oxygen in the stack gas is at the lower end of the range of typical minimum values²; and if CO emissions are low and there is no smoke, the unit is probably operating at near optimum efficiency - at this particular firing rate. However, complete the remaining portion of this procedure to determine whether still lower oxygen levels are practical.

3. Increase combustion air flow to the furnace until stack gas oxygen levels increase by one to two percent over the level measured in Step 2. As in Step 2, record the stack gas temperature, CO concentration (for gaseous fuels) or smoke spot number (for liquid fuels), and observe flame conditions for these higher oxygen levels after boiler operation stabilizes.
4. Decrease combustion air flow until the stack gas oxygen concentration is at the level measured in Step 2. From this level gradually reduce the combustion air flow, in small increments. After each increment, record the stack gas temperature, oxygen concentration, CO concentration (for gaseous fuels) and smoke-spot number (for liquid fuels). Also, observe the flame and record any changes in its condition.
5. Continue to reduce combustion air flow stepwise, until one of these limits is reached:
 - a. Unacceptable flame conditions - such as flame impingement on furnace walls or burner parts, excessive flame carryover, or flame instability.
 - b. Stack gas CO concentrations greater than 400 ppm.

1. The smoke-spot number can be determined with ASTM Test Method D-2156 or with the Bacharach method.
2. Typical minimum oxygen levels for boilers at high firing rates are:

For natural gas: 0.5% - 3%

For liquid fuels: 2% - 4%

- c. Smoking at the stack.
 - d. Equipment-related limitations-such as low windbox/furnace pressure differential, built in air-flow limits, etc.
6. Develop an O₂/CO curve (for gaseous fuels) or O₂/smoke curve (for liquid fuels) similar to those shown in Figures 1 and 2 on Page 425-10 using the excess oxygen and CO or smoke-spot number data obtained at each combustion air flow setting.
 7. From the curves prepared in Step 6, find the stack gas oxygen levels where the CO emissions or smoke-spot number equal the following values:

<u>Fuel</u>	<u>Measurement</u>	<u>Value</u>
Gaseous	CO Emissions	400 ppm
#1 and #2 Oils	smoke-spot number	number 1
#4 Oil	smoke-spot number	number 2
#5 Oil	smoke-spot number	number 3
Other Oils	smoke-spot number	number 4

The above conditions are referred to as the CO or smoke thresholds, or as the minimum excess oxygen levels.

Compare this minimum value of excess oxygen to the expected value provided by the combustion unit manufacturer. If the minimum level found is substantially higher than the value provided by the combustion unit manufacturer, burner adjustments can probably be made to improve fuel and air mix, thereby allowing operations with less air.

8. Add 0.5 to 2.0 percent to the minimum excess oxygen level found in Step 7 and reset burner controls to operate automatically at this higher stack gas oxygen level. This margin above the minimum oxygen level accounts for fuel variations, variations in atmospheric conditions, load changes, and nonrepeatability or play in automatic controls.
9. If the load of the combustion unit varies significantly during normal operation, repeat Steps 1-8 for firing rates that represent the upper and lower limits of the range of the load. Because control adjustments at one firing rate may affect conditions at other firing rates, it may not be possible to establish the optimum excess oxygen level at all firing rates. If this is the case, choose the burner control settings that give best performance over the range of firing rates. If one firing rate predominates, setting should optimize conditions at that rate.

10. Verify that the new settings can accommodate the sudden load changes that may occur in daily operation without adverse effects. Do this by increasing and decreasing load rapidly while observing the flame and stack. If any of the conditions in Step 5 result, reset the combustion control to provide a slightly higher level of excess oxygen at the affected firing rates. Next verify these new settings in a similar fashion. Then make sure that the final control settings are recorded at steady-state operating conditions for future reference.

Oxygen/CO Characteristic Curve

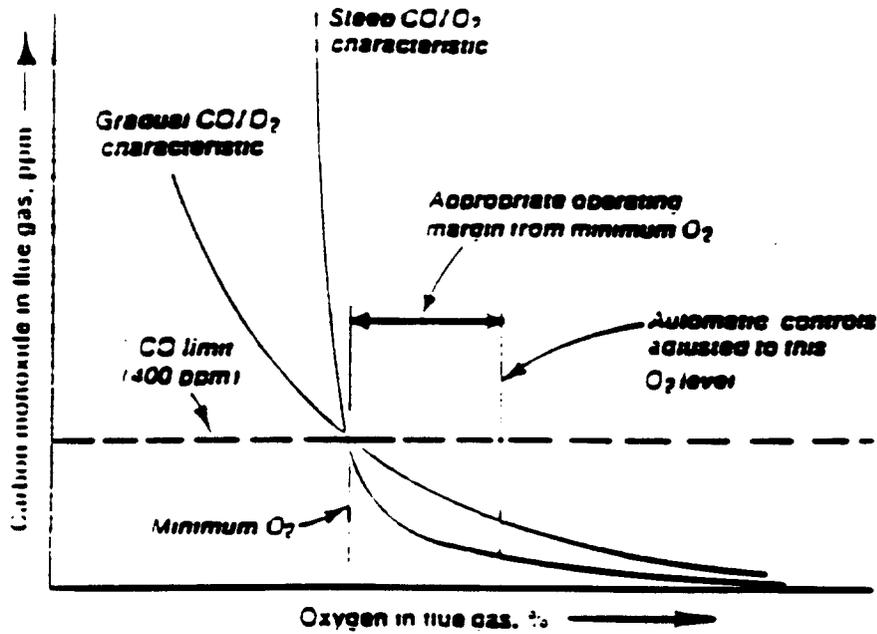
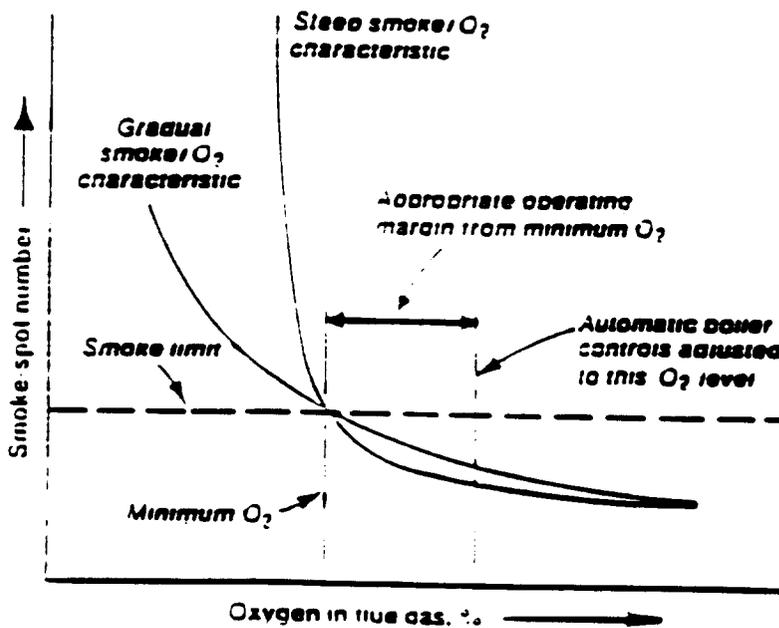


Figure 2

Oxygen/Smoke Characteristic Curve



3/23/81

RULE 426 Experimental Research Operations The Control Officer may exempt experimental research operations from the provisions of Regulation IV, except Rule 419, when all of the provisions of Rule 202.1 are met: