MONTEREY BAY UNIFIED AIR POLLUTION CONTROL DISTRICT

RULE 431 -- EMISSIONS FROM ELECTRIC POWER BOILERS
(Adopted 9-15-93) (Revised 8-16-95; 12-17-97; 6-16-99; and 10-17-01)

CONTENTS

PART 1 GENERAL

1.1 Purpose

The purpose of this Rule is to provide limitations on emissions of nitrogen oxides (NO_x) and carbon monoxide (CO) during the combustion of natural gas or fuel oil by boilers providing steam for electric power generation.

1.2 Applicability

The provisions of this Rule apply to all electric power boilers at the electric power generation facility located at Moss Landing.

1.3 Exemptions

1.3.1 The provisions of Subsection 3.1 of this Rule shall not apply if a force majeure natural gas curtailment, as defined in Section 2.9 herein, is in effect.

1.3.2 The provisions of Subsection 3.1 of this Rule shall not apply during a fuel oil system test or a District-mandated emissions test.

1.3.3 The provisions of Section 3.4 and Subsections 3.7.1.1, 3.7.1.2, and 3.7.2 of this Rule shall not apply during periods of start-up, as defined in Section 2.16 herein, or shut-down, as defined in Section 2.15 herein.

1.4 Effective Dates

This Rule, as most recently revised, is effective October 17, 2001. Specific dates for attainment of reduced emissions levels are provided in relevant sections of Part 3 of this Rule.

1.5 References

The requirements of this Rule arise from the provisions of the California Clean Air Act and amendments (Health and Safety Code Section 40910 *et seq.*) and from the requirements of Section 182(f) of the Federal Clean Air Act as amended (Title 42 United States Code Section 7401 *et seq.*)

PART 2 DEFINITIONS

2.1 Boiler

An individual piece of combustion equipment fired with liquid and/or gaseous fuel and used to produce steam.

2.2 Carbon Monoxide (CO)

The molecular species, carbon monoxide.

2.3 Clock-hour Average Emissions

Emissions based on a one-hour average computed from data points equally spaced over each clock-hour period.

2.3.1 For each continuous emission monitoring system (CEMS) associated with any electric power boiler subject to this Rule, the data shall be collected at a frequency of at least 4 data points per clock-hour.

2.4 Continuous Emission Monitoring System (CEMS)

The total equipment required for the continuous determination and record keeping of a stack's gas concentration or emission rate.

2.5 Electric Power Boiler

A boiler used to produce steam for electric power generation.

2.6 Electric Power Generation Facility

The existing facility located at Moss Landing that generates electricity for offsite use.

2.7 Emergency Conditions

When the electric power generation facility is required to request or provide emergency support.

2.7.1 For the purposes of this Rule, this definition is limited to those situations in which the applicable procedures for requesting emergency relief have been followed, including system determination that normal arrangements for capacity and energy are not sufficient to meet a system's requirements, and the next relief measure for either the requesting or responding system is reduction of firm load.

2.8 Emissions

The rate of quantitative releases to the atmosphere from an emission point as measured by the continuous emission monitoring system (CEMS) and calculated by the methods specified in the unit's Permit to Operate.

2.9 Force Majeure Natural Gas Curtailment

An interruption in natural gas service, such that the daily fuel needs of a boiler cannot be met with the natural gas available, due to one of the following reasons:

2.9.1 an unforeseeable failure or malfunction, not resulting from an intentional act or omission which the California Public Utilities Commission (CPUC) finds to be due to an act of gross negligence on the part of the owner or operator of a boiler; or

2.9.2 a natural disaster; or

2.9.3 natural gas service is curtailed pursuant to CPUC rules or orders; or

2.9.4 the electric power generation facility provides notice to the District that, with forecasted supplies and demands, natural gas service is expected to be curtailed pursuant to CPUC rules or orders.

2.10 Fuel Oil System Test Period

The period of time during which a boiler system is operated on fuel oil for the purpose of testing the ability to operate on fuel oil, or to conduct a CPUC-required performance test.

2.11 Fuel Switching Period

The time period during which fuel type (gaseous or liquid) is gradually being changed from one type to another, and as a consequence, a mixture of fuel types is being used.

2.12 Nitrogen Oxides (NO_x)

The sum of the molecular forms of nitrogen oxide and nitrogen dioxide in stack gas. When measured or calculated, the total of the two molecular forms are collectively expressed as nitrogen dioxide.

2.13 Oil Operation Hours

2.13.1 Operation of a boiler on fuel oil or a mixture of fuel oil and natural gas shall be counted as oil operating hours.

2.13.2 Operation of a boiler on fuel oil during District-mandated source testing shall not be counted as oil operating hours.

2.14 Parts-per-million (ppm)

Parts-per-million by volume.

2.15 Shut-down Period

2.15.1 For those units without catalytic emissions reduction equipment, the time period during which a unit is reduced below minimum load, to a condition where the fires in the boiler(s) are extinguished, not to exceed eight (8) hours.

2.15.2 For those units with catalytic emissions reduction equipment, the time period during which a unit is reduced below minimum load or catalytic reduction temperature, to a condition where the fires in the boiler are extinguished, not to exceed eight (8) hours.

2.16 Start-up Period

2.16.1 For those units without catalytic emissions reduction equipment, the time period during which a boiler has no fires in it, until the unit that it serves has reached minimum operating load, not to exceed twelve (12) hours.

2.16.2 For those units with catalytic emissions reduction equipment, the time period during which a boiler has no fires in it, until the unit that it serves has reached minimum operating load, the catalytic reaction temperature and main breaker closure.

2.17 Unit

In reference to electric power generating equipment, an electric power generating system consisting of at least one boiler and one turbine-generator.

PART 3 REQUIREMENTS AND STANDARDS

3.1 Restrictions on the Use of Fuel Oil

Oil and mixtures of oil and natural gas shall not be used as fuel for electric power boilers.

3.2 Restrictions on Fuel Oil System Test Periods

Fuel oil system test periods for any boiler shall not exceed a total of 24 hours between May 1 and October 31 annually, or 96 hours per year for any boiler.

3.3 Restrictions on the Use of Anhydrous Ammonia

Anhydrous ammonia shall not be used as the feed-stock in NO_x emission control systems for boilers regulated under the provisions of this Rule, unless environmental, health and safety concerns have been mitigated to the satisfaction of the Air Pollution Control Officer.

3.4 CO Emission Limits

Carbon monoxide (CO) emissions from any electric power boiler shall not exceed the following limits:

3.4.1 during steady-state compliance tests: 400 ppm, based upon a 60-consecutive minute

average;

3.4.2 during normal operations: 1000 ppm, based on a one (1) hour clock-hour average at three (3) percent oxygen on a dry basis.

3.5 NH_3 Emission Limits

3.5.1 NH_3 emissions from any emission control device installed and operated pursuant to the requirements of this Rule shall not exceed 10 ppm, based upon a 60-consecutive minute average.

3.5.2 A monthly source test using the methods referenced in Subsection 3.8.2 herein shall be performed to determine compliance with this limit and reported to the District monthly, or less frequently if deemed appropriate by the Air Pollution Control Officer.

3.6 NO_x Emission Limits During Fuel Switching Periods

The NO_x emission limits during the first six (6) hours of a fuel switching period shall be the applicable fuel oil emission limit. The NO_x emission limit after the first six (6) hours in a fuel switching period is expressed as follows:

3.6.1 NO_x limit = $[(f_1)(N_1)] + [(f_2)(N_2)]$, where:

f_1 = (total heat input from oil)/(total heat input)

f_2 = (total heat input from natural gas)/(total heat input)

N_1 = oil NO_x limit

N_2 = natural gas NO_x limit

3.7 NO_x Emission Limits for Electric Power Boilers

3.7.1 Emissions of nitrogen oxides from the electric power boilers shall not exceed the following limits based on a one (1) hour average at three (3) percent oxygen (O_2) on a dry basis:

3.7.1.1 during operation on natural gas: 90 ppm above 400 gross MW; 450 lb/hr at or below 400 gross MW.

3.7.1.2 during operation on fuel oil: 225 ppm.

3.7.1.3 During the period from May 1 through October 31 each year, the total NO_x emissions from all units shall not exceed an average of 9.64 tons per day.

3.7.2 The electric power generation facility shall comply with the following schedule for the two electric power boilers. Effective December 31, 2000 for one unit, and July 31, 2002 for the second unit, emissions of nitrogen oxides from the electric power boilers shall not exceed the following limits based on a one (1) hour average at three (3) percent oxygen (O_2) on a dry basis:

3.7.2.1 during operation on natural gas: 10 ppm;

3.7.2.2 during operation on fuel oil: 25 ppm.

3.7.3 Any time the two electric power boilers at the electric power generation facility are subject to different NO_x emission limits under this Rule, when both units are available, the owner or operator shall preferentially operate the unit subject to the lower emission limit, such that its MW-hours equal or exceed the MW-hours of the unit subject to the higher emission limit, provided that such preferential operation shall not impair the provision of reliable electric service.

3.7.4 In addition to any applicable one hour average emission limits, the maximum allowable average nitrogen oxide emissions from all electric power boilers at the electric power generation facility shall not exceed 0.30 pounds of NO_x per million Btu.

3.7.4.1 Compliance with the 0.30 pounds of NO_x per million Btu limit may be determined on a continuous basis through the use of a 30-day rolling average emission rate, calculated each operating day as the average of all hourly data for the preceding 30 operating days.

3.8 Stationary Source Test Measurements

3.8.1 For determination of CO emissions concentrations in stack gases during stationary source tests, 40 CFR Part 60, App. A, Method 10 (EPA Method 10, "Determination of Carbon Monoxide Emissions from Stationary Sources") or California Air Resources Board (ARB) Method 100, "Procedures for Continuous Gaseous Emission Stack Sampling" shall be performed.

3.8.2 For determination of NH_3 concentrations in stack gases during stationary source tests of controlled equipment which use NH_3 as a reagent, Bay Area Air Quality Management District (BAAQMD) Source Test Procedure ST-1B, "Ammonia, Integrated Sampling" and EPA Method 350.3, "Ion Specific Electrode", shall be performed. Alternate methods may not be used without prior approval of the Air Pollution Control Officer and, if

necessary, the California Air Resources Board and United States Environmental Protection Agency.

3.8.3 For determination of NO_x emissions concentrations in stack gases during stationary source tests, 40 CFR Part 60, App. A, Method 7E (EPA Method 7E, "Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure)") or ARB Method 100, "Procedures for Continuous Gaseous Emission Stack Sampling", shall be performed.

3.8.4 For determination of O_2 concentrations in stack gases during stationary source tests, 40 CFR Part 60, App. A, Method 3A (EPA Method 3A, "Determination of O_2 and CO_2 Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)") or ARB Method 100, "Procedures for Continuous Gaseous Emission Stack Sampling" shall be performed.

3.8.5 In addition, all stationary source testing shall be performed in compliance with the District Source Testing Procedures Manual.

3.9 Continuous Emission Monitoring Systems (CEMSs)

3.9.1 Each CEMS associated with an electric power boiler subject to this Rule shall complete a minimum of one cycle of operation (sampling, analyzing and data recording) for each successive 15-minute period.

3.9.2 CEMS electronic data files shall be made available in a District-approved format compatible with electronic data transfer.

3.9.3 For all boilers subject to this Rule, continuous emission monitoring systems (CEMSs) which meet the federal requirements referenced below shall be installed, certified, maintained and operated for continuous in-stack monitoring necessary to calculate CO emission rates corrected to three (3) percent oxygen on a dry basis:

3.9.3.1 40 CFR Part 60, App. B, Spec. 4 (EPA Performance Specification 4, "Specifications and Test Procedures for Carbon Monoxide Continuous Emission Monitoring Systems in Stationary Sources"); and

3.9.3.2 40 CFR Part 60, App. B, Spec. 3 (EPA Performance Specification 3, "Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources").

3.9.4 For all boilers subject to this Rule, continuous emission monitoring systems (CEMSs) which meet the federal requirements referenced below shall be installed, certified,

maintained and operated for continuous in-stack monitoring necessary to calculate NO_x emission rates corrected to three (3) percent oxygen on a dry basis:

3.9.4.1 40 CFR Part 75 and Appendices (Continuous Emission Monitoring);

3.9.4.2 40 CFR Part 60, App. B, Spec. 2 (EPA Performance Specification 2, "Specifications and Test Procedures for SO_2 and NO_x Continuous Emission Monitoring Systems in Stationary Sources"); and

3.9.4.3 40 CFR Part 60, App. B, Spec. 3 (EPA Performance Specification 3, "Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources").

3.9.5 Operators of the continuous emission monitoring systems (CEMSs) must follow the EPA quality assurance procedures referenced below:

3.9.5.1 40 CFR Part 75, App. B (Appendix B to Part 75 - Quality Assurance and Quality Control Procedures); and

3.9.5.2 40 CFR Part 60, App. F (Appendix F to Part 60 - Quality Assurance Procedures "Procedure 1. Quality Assurance Requirements for Gas Continuous Emission Monitoring Systems Used for Compliance Determination").

3.10 Calculation of Average Emissions

3.10.1 For CEMSs, average emissions shall be calculated as clock-hour averages. Conversions shall be calculated according to the procedures within 40 CFR Part 75, App. F (Appendix F to Part 75 - Conversion Procedures).

3.10.2 For steady state compliance testing required by Subsections 3.8.1, 3.8.3 and 3.8.4, the average emissions shall be calculated as 60-consecutive minute averages, instead of clock-hour averages.

3.10.3 Data recorded during periods of continuous emission monitoring system (CEMS) breakdowns, repairs, calibration checks, and zero and span adjustments shall not be included in the data averages computed under this Section. Missing data shall be estimated following the procedures of 40 CFR Part 75, App. C (Appendix C to Part 75 - Missing Data Statistical Estimation Procedures).

3.10.4 An arithmetic or integrated average of all data may be used.

3.10.5 After conversion into the same units of measure as the standard, the data may be

rounded to the same numbers of significant digits as used in the applicable subsections to specify the emission limit.

PART 4 ADMINISTRATIVE REQUIREMENTS

4.1 Implementation Plan

4.1.1 By December 31, 1998, the owner or operator of an applicable unit shall submit for approval to the Air Pollution Control Officer an Implementation Plan for compliance with the provisions of Subsection 3.7.2 of this Rule.

4.1.2 The Implementation Plan shall propose actions and alternatives which will be taken to meet or exceed the requirements of this Rule. At a minimum, the Plan shall include:

4.1.2.1 a list of all units subject to the Rule, including the manufacturer, model number, and maximum rated capacity for each unit; and

4.1.2.2 a description of the emissions control systems proposed for each unit, as well as a description of any ancillary equipment related to the control of emissions, and expected technical performance specifications for any CO and NO_x emissions control systems; and

4.1.2.3 a description of the continuous emission monitoring system (CEMS) proposed for each unit; and

4.1.2.4 a compliance schedule for each unit, including, but not limited to, specific dates for the following events: submittal of permit applications, final engineering, contract award, begin construction, planned operation phases, complete construction, and final compliance, including certification of any CEMS.

4.2 Authority to Construct

The owner or operator of an applicable unit shall submit complete applications for the Authorities to Construct required to install any equipment necessary to comply with the provisions of Subsection 3.7.2 of this Rule to the Air Pollution Control Officer twelve months prior to the scheduled beginning of construction stated in the relevant District-approved Implementation Plan.

4.3 Record-keeping Requirements

4.3.1 For any electric power boiler subject to this Rule, permanent hourly records, or records in a District-approved electronic format, shall be maintained for a period of five years after creation and shall be made available for inspection by the Air Pollution Control Officer upon request. The records for each hour shall include, but are not limited to:

4.3.1.1 dates, times and durations of any start-up and shut-down periods;

4.3.1.2 type of fuel oil burned and its sulfur content as determined by the methods referenced in 40 CFR Part 75 Appendix D Subsections 2.2.3 and 2.2.4;

4.3.1.3 quantity of fuel burned;

4.3.1.4 gross and net energy production in Megawatt-hours (MW-hrs);

4.3.1.5 the injection rate of reactant chemicals;

4.3.1.6 the CO emissions concentration in ppm, corrected to three percent oxygen (O_2) on a dry basis, based on data from the in-stack continuous emission monitoring system (CEMS); and

4.3.1.7 the NO_x emissions in lb/hr and ppm, corrected to three percent oxygen (O_2) on a dry basis, based on data from the in-stack continuous emission monitoring system (CEMS).

4.3.1.8 During the period from May 1 through October 31 of each year, the total daily NO_x emissions, in pounds per day corrected to three percent oxygen on a dry basis, for all units must be recorded, based on data from the in-stack continuous emission monitoring system (CEMS). The seasonal average from May 1 through October 31 of each year in pounds per day shall be calculated based upon these daily data.

4.3.2 For any CEMS subject to this Rule, records of all raw and processed data for parameters measured shall be maintained for a period of five years after creation and shall be made available for inspection by the Air Pollution Control Officer upon request. These records may be kept in a District-approved electronic format.

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