

## **REGULATION 6.02     Emission Monitoring for Existing Sources**

### **Air Pollution Control District of Jefferson County Jefferson County, Kentucky**

**Relates To:** KRS Chapter 77 Air Pollution Control

**Pursuant To:** KRS Chapter 77 Air Pollution Control

**Necessity And Function:** KRS 77.180 provides that the air pollution control board may make and enforce all needful orders, rules, and regulations necessary or proper to accomplish the purposes of KRS Chapter 77. This regulation establishes the procedures for emission monitoring for existing sources.

#### **SECTION 1**

This regulation defines the minimum requirements for continuous emission monitoring, recording, and reporting for source categories which are set forth. It includes the performance specifications for accuracy, reliability, and durability of acceptable monitoring systems and techniques to convert emission data to units of applicable emission standards. This regulation applies to source categories which were in being or had a construction permit issued by the District on or before June 29, 1979. The owner or operator of a source in a category listed below shall:

- 1.1 Install, calibrate, operate and maintain all monitoring equipment necessary for continuously monitoring the pollutants specified in this section for the applicable source category; and
- 1.2 Complete the installation and performance tests of such equipment and begin monitoring and recording by January 1, 1981.
- 1.3 For continuous emission monitoring systems for which there are no performance specifications under 40 CFR Part 60 Appendix B, complete the installation and performance tests of such equipment and begin monitoring and recording within 18 months of promulgation of the applicable performance specifications of 40 CFR Part 60 Appendix B.

#### **SECTION 2**

The source categories and the respective monitoring requirements are listed below:

- 2.1 Indirect heat exchangers, as specified in section 6.1, shall be monitored for opacity, sulfur dioxide emissions, and oxygen or carbon dioxide.
- 2.2 Petroleum refinery affected facilities, as specified in section 6.2, shall be monitored as specified in section 6.2.
- 2.3 Incinerators, as specified in section 6.3, shall be monitored for opacity.
- 2.4 Control devices, as specified in section 6.4, shall be monitored for opacity.

#### **SECTION 3 Exemption**

Sources which are scheduled for retirement within five years after June 29, 1979 are exempt from this regulation, provided that adequate evidence and guarantees are submitted that clearly show that the source will cease operating on or before that date.

#### **SECTION 4 Extensions**

Reasonable extensions of the time provided for installation of monitors may be allowed for sources unable to meet the time-frame prescribed in section 1.2 provided the owner or operator of such facility demonstrates that good faith efforts have been made to obtain and install the devices within the prescribed time-frame.

#### **SECTION 5 Monitoring Systems Malfunctions**

The District may provide a temporary exemption from the monitoring and reporting requirements of this regulation during any period of monitoring system malfunction, provided that the source owner or operator shows, to the District's satisfaction, that the malfunction was unavoidable and is being repaired as expeditiously as practicable.

#### **SECTION 6 Monitoring Requirements**

- 6.1 Each indirect heat exchanger, except as provided in the following sections, with an annual average capacity factor of greater than 30% as demonstrated to the District by the owner or operator, shall conform with the following monitoring requirements when such facility is subject to an emission standard for the pollutant in question. (Annual average capacity factor means the ratio of the actual annual heat input to the potential annual heat input based on rated capacity.)
  - 6.1.1 A continuous monitoring system for the measurement of opacity which meets the appropriate performance specification as specified in section 7 shall be installed, calibrated, maintained, and operated in accordance with the procedures of this section by the owner or operator of any such indirect heat exchanger of greater than 250 million BTU per hour heat input except where: gaseous fuel is the only fuel burned, or oil or a mixture of gas and oil are the only fuels burned and the source is able to comply with the applicable particulate matter and opacity standards without utilization of particulate matter collection equipment, and where the source has never been found, through any administrative or judicial proceedings, to be in violation of any visible emission standard.
  - 6.1.2 A continuous monitoring system for the measurement of sulfur dioxide which meets the appropriate performance specifications in section 7 shall be installed, calibrated, maintained, and operated on any indirect heat exchangers (except where natural gas or wood waste is burned) of greater than 250 million BTU per hour heat input.
  - 6.1.3 A continuous monitoring system for the measurement of the percent oxygen or carbon dioxide which meets the appropriate performance specifications in section 7 shall be installed, calibrated, operated, and maintained on indirect heat exchangers where measurements of oxygen or carbon dioxide in the flue gas are required to convert either sulfur dioxide or nitrogen oxides continuous emission monitoring data, or both, to units of the emission standard.
- 6.2 Petroleum Refineries. The owner or operator of each affected facility specified in this section shall install, calibrate, maintain, and operate continuous monitoring equipment as follows:
  - 6.2.1 Fluid bed catalytic cracking unit catalyst regenerators at petroleum refineries. Each catalyst regenerator for fluid bed cracking units of greater than 8,000 barrels per day fresh feed capacity shall install, calibrate, maintain and operate a continuous monitoring

- system for the measurement of opacity that meets the appropriate performance specifications in section 7.
- 6.2.2 A continuous monitoring system for the measurement of sulfur dioxide in the gases discharged into the atmosphere from the combustion of fuel gases subject to Regulation 6.10 that meets the appropriate performance specifications in section 7 (except where a continuous monitoring system for the measurement of hydrogen sulfide is installed under section 6.2.3). The pollutant gas used to prepare calibration gas mixtures under Performance Specification 2 of 40 CFR Part 60 Section 2.1 and for the calibration checks shall be sulfur dioxide. The span shall be set at 100 ppm. For conducting monitoring system performance evaluations, Reference Method 6 shall be used.
- 6.2.3 An instrument for continuously monitoring and recording concentrations of hydrogen sulfide in fuel gases burned in any fuel gas combustion device subject to Regulation 6.10 that meets the appropriate performance specifications in section 7, if compliance is achieved by removing hydrogen sulfide from the fuel gas before it is burned; fuel gas combustion devices having a common source of fuel gas may be monitored at one location, if monitoring at this location accurately represents the concentration of hydrogen sulfide in the fuel gas burned. The span of the continuous monitoring shall be 300 ppm.
- 6.2.4 An instrument for continuously monitoring and recording concentrations of sulfur dioxide in the gases discharged into the atmosphere from any Claus sulfur recovery plant subject to Regulation 6.10 that meets the appropriate performance specifications in section 7, if compliance is achieved through the use of an oxidation control system or a reduction control system followed by incineration. The span of this continuous monitoring system shall be set at 500 ppm.
- 6.2.5 Instruments for continuously monitoring and recording the concentration of hydrogen sulfide and reduced sulfur compounds in the gases discharged into the atmosphere from any Claus sulfur recovery plant subject to Regulation 6.10 that meet the appropriate performance specifications in section 7, if compliance is achieved through the use of a reduction control system and followed by incineration. The spans of this continuous monitoring system shall be set at 20 ppm for monitoring and recording the concentration of hydrogen sulfide and 600 ppm for monitoring and recording the concentration of reduced sulfur compounds.
- 6.2.6 An instrument for continuously monitoring and recording the concentration of sulfur dioxide in gases discharged into the atmosphere from fluid catalytic cracking unit catalyst regenerator subject to Regulation 6.10 that meets the appropriate performance specifications in section 7. The span of this continuous monitoring system shall be 1,500 ppm.
- 6.3 Incinerators. Each incinerator with a charging capacity of more than 45 metric tons per day (50 tons/day) shall install, calibrate, maintain, and operate a continuous monitoring system for opacity which meets the specifications in section 7.
- 6.4 Each control device with a concentrated discharge associated with the affected facilities subject to Regulation 6.11 shall install, calibrate, maintain, and operate a continuous monitoring system for the measurement of opacity which meet the appropriate performance specifications in section 7.

## **SECTION 7**

Except as provided in section 8, all owners or operators who are required to comply with this regulation shall demonstrate compliance with the following performance specifications of 40 CFR Part 60 Appendix B:

- 7.1 Continuous monitoring systems for measuring opacity shall comply with Performance Specification 1.
- 7.2 Continuous monitoring systems for measuring sulfur dioxide shall comply with Performance Specification 2.
- 7.3 Continuous monitoring systems for measuring nitrogen oxides shall comply with Performance Specification 2.
- 7.4 Continuous monitoring systems for measuring oxygen shall comply with Performance Specification 3.
- 7.5 Continuous monitoring systems for measuring carbon dioxide shall comply with Performance Specification 3.

## **SECTION 8**

An owner or operator who, prior to September 11, 1974, entered into a binding contractual obligation to purchase continuous monitoring system components or who installed continuous monitoring equipment prior to October 6, 1975 shall comply with the following requirements:

- 8.1 Continuous monitoring systems for measuring opacity of emissions shall be capable of measuring emission levels within 20% with a confidence level of 95%. The Calibration Error Test and associated calculation procedures set forth in Performance Specification 1 of 40 CFR Part 60 Appendix B shall be used for demonstrating compliance with this specification;
- 8.2 Continuous monitoring systems for measurement of nitrogen oxides or sulfur dioxide shall be capable of measuring emission levels within 20% with a confidence level of 95%. The Calibration Error Test, the Field Test for Accuracy (Relative), and associated operating and calculation procedures set forth in 40 CFR Part 60 Appendix B shall be used for demonstrating compliance with this specification;
- 8.3 Owners or operators of all continuous monitoring systems installed on an affected facility prior to October 6, 1975, may be required to conduct tests under sections 8.1 and/or 8.2 if requested by the District;
- 8.4 All continuous monitoring systems referenced by this section shall be upgraded or replaced (if necessary) with new continuous monitoring systems, and the new or improved systems shall be demonstrated to comply with applicable performance specifications within five years of June 29, 1979.

## **SECTION 9 Calibration Gases**

For sulfur dioxide monitoring systems installed on indirect heat exchangers the pollutant gas used to prepare calibration gas mixtures (40 CFR Part 60 Appendix B Section 2.1 Performance Specification 2) shall be sulfur dioxide. This gas shall also be used for daily checks under section 13 as applicable. Span and zero gases certified by their manufacturer to be traceable to National Bureau of Standards reference gases shall be used whenever these reference gases are available.

Every six months from dates of manufacture, span and zero gases shall be re-analyzed by conducting triplicate analyses using the reference methods in 40 CFR Part 60 Appendix A as follows: for sulfur dioxide, use Reference Method 6, for nitrogen dioxide use Reference Method 7, and for carbon dioxide and oxygen use Reference Method 3.

#### **SECTION 10     Cycling Times**

Cycling times include the total time a monitoring system requires to sample, analyze, and record an emission measurement.

- 10.1    Continuous monitoring systems for measuring opacity shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive ten second period.
- 10.2    Continuous monitoring systems for measuring oxides of nitrogen, carbon dioxide, oxygen, or sulfur dioxide shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15 minute period.

#### **SECTION 11     Monitor Location**

A continuous monitoring device shall be installed such that representative measurements of emissions or process parameters (i.e., oxygen or carbon dioxide) from the affected facility are obtained. Additional guidance for location of continuous monitoring systems to obtain representative samples are contained in the applicable Performance Specifications of 40 CFR Part 60 Appendix B.

#### **SECTION 12     Combined Effluents**

When the effluents from two or more affected facilities of similar design and operating characteristics are combined before being released to the atmosphere, the District may allow monitoring systems to be installed on the combined effluent. When the affected facilities are not of similar design and operating characteristics, or when the effluent from one affected facility is released to the atmosphere through more than one point, the District shall establish alternate procedures to implement the intent of these requirements.

#### **SECTION 13     Zero and Span Drift**

Owners or operators of all continuous monitoring systems installed in accordance with the requirements of this section shall record the zero and span drift in accordance with the method prescribed by the manufacturer of such instruments; shall subject the instruments to the manufacturer's recommended zero and span check at least once daily unless the manufacturer has recommended adjustments at shorter intervals, in which case the recommendations shall be followed; shall adjust the zero and span whenever the 24 hour zero drift or 24 hour calibration drift limits of the applicable performance specifications in 40 CFR Part 60 Appendix B are exceeded; and to adjust continuous monitoring systems referenced by section 8 whenever the 24 hour zero drift or 24 hour calibration drift exceeds 10% of the emission standard.

#### **SECTION 14     Span**

Instrument span should be approximately 200% of the expected instrument data display output corresponding to the emission standard of the source.

## **SECTION 15     Alternate Procedures and Requirements**

The District may allow equivalent procedures and requirements that have been approved by EPA for continuous monitoring systems under the following conditions:

- 15.1 Alternate monitoring requirements to accommodate continuous monitoring systems that require corrections for stack moisture conditions (e.g., an instrument measuring oxygen concentration on a dry basis if acceptable methods of measuring stack moisture conditions are used to allow accurate adjustments of the measured sulfur dioxide concentration to a dry basis).
- 15.2 Alternate locations for installing continuous monitoring systems or monitoring devices when the owner or operator can demonstrate to the satisfaction of the District that installation at alternate locations will enable accurate and representative measurements.
- 15.3 Alternative procedures for performing calibration checks (e.g., some instruments may demonstrate superior drift characteristics that require checking at less frequent intervals).
- 15.4 Alternative monitoring requirements when the effluent from two or more identical affected facilities is released to the atmosphere through more than one point (e.g., an extractive, gaseous monitoring system used at several points may be approved if the procedures recommended are suitable for generating accurate emission averages).
- 15.5 Alternate continuous monitoring systems that do not meet the spectral response requirements in 40 CFR Part 60 Appendix B Performance Specification 1, but adequately demonstrate a definite and consistent relationship between their measurements and the opacity measurements of a system complying with the requirements in Performance Specification 1. The District may require that such demonstration be performed for each affected facility.

## **SECTION 16     Minimum Data Requirements**

The following sections set forth the minimum data reporting requirements. Both a printed summary and computer tape or cards shall be furnished in the format specified by the District.

- 16.1 Owners or operators of facilities required to install continuous monitoring systems shall submit for every calendar quarter, a written report of excess emissions and the nature and cause of the excess emissions if known. The averaging period used for data reporting should correspond to the averaging period specified in the emission test method used to determine compliance with an emission standard for the pollutant/source category in question. The required report shall include, as a minimum, the data stipulated in this section. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter.
- 16.2 For opacity measurements, the summary shall consist of the magnitude in actual percent opacity of six-minute averages of opacity greater than the opacity standard in the applicable standard for each hour of operation of the facility. Average values may be obtained by integration over the averaging period or by arithmetically averaging a minimum of four equally spaced, instantaneous opacity measurements per minute. Any time period exempted shall be considered before determining the excess average of opacity (e.g., whenever a regulation allows two minutes of opacity measurements in excess of the standard, the source shall report all opacity averages, in any one hour, in excess of the standard minus the two-minute exemption). If more than one opacity standard applies, excess emissions data must be submitted in relation to all such standards. Opacity data need be reported on computer cards or tape only.

- 16.3 For gaseous measurements the summary shall consist of hourly averages in the units of the applicable standard. The hourly averages shall not appear in the written summary, but shall be made available from the computer tape or cards.
- 16.4 The data and time identifying each period during which the continuous monitoring system was inoperative, except for zero and span checks, and the nature of system repairs or adjustment shall be reported. Proof of continuous monitoring system performance whenever system repairs or adjustments have been made is required.
- 16.5 When no excess emissions have occurred and the continuous monitoring systems have been inoperative, repaired, or adjusted, such information shall be included in the report.
- 16.6 Owners or operators of affected facilities shall maintain a file of all information reported in the quarterly summaries, and all other data collected either by the continuous monitoring system or as necessary to convert monitoring data to the units of the applicable standard for a minimum of two years from the date of collection of such data or submission of such summaries.

**SECTION 17**

Owners or operators of affected facilities shall use the following procedures for converting monitoring data to units of the standard where necessary:

- 17.1 For indirect heat exchangers the following procedures shall be used to convert gaseous emission monitoring data in parts per million to g/million cal (1b/million BTU) where necessary:
  - 17.1.1 When the owner or operator of an indirect heat exchanger elects under section 6.1.3 to measure oxygen in the flue gases, the measurements of the pollutant concentration and oxygen shall each be on a dry basis and converted per the following equation:

$$E = \frac{20.9CF}{20.9 - \%O_2}$$

where:

- E = pollutant emission, g/million cal (1b/million BTU).
- C = pollutant concentration, g/dscm (1b/dscf), determined by multiplying the average concentration (ppm) for each hourly period by 4.16 x 10<sup>-5</sup> g/dscm per ppm (2.64 x 10<sup>-9</sup> M 1b/dscf per ppm) where M = pollutant molecular weight, g/g-mole (1b/1b-mole). M = 64 for sulfur dioxide and 46 for oxides of nitrogen.
- F = a factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted (F). Values of "F" are given in Regulation 7.06.

%O<sub>2</sub> = Oxygen volume (expressed as percent).

- 17.1.2 When the owner or operator elects under section 6.1.3 to measure carbon dioxide in the flue gases, the measurement of the pollutant concentration and the carbon dioxide concentration shall each be on a consistent basis (wet or dry) and converted per the following equation:

$$E = \frac{100CFC}{\%CO_2}$$

where:

- E = pollutant emission, g/million cal (1b/million BTU).  
 C = pollutant concentration, g/dscm (1b/dscf), determined by multiplying the average concentration (ppm) for each hourly period by  $4.16 \times 10^{-5}$  M g/dscm per ppm ( $2.64 \times 10^{-9}$  M lb/dscf per ppm) where M = pollutant molecular weight, g/g-mole (lb/lb-mole). M = 64 for sulfur dioxide and 46 for oxides of nitrogen.  
 Fc = a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted (Fc) respectively. Values of Fc are given in Regulation 7.06.  
 %CO<sub>2</sub> = carbon dioxide volume (expressed as percent).

- 17.2 The District may allow data reporting or reduction procedures varying from those set forth in this regulation if the owner or operator of a source shows to the satisfaction of the District that his procedures are at least as accurate as those in this section. Such procedures may include but are not limited to the following:
- 17.2.1 Alternative procedures for computing emission averages that do not require integration of data (e.g., some facilities may demonstrate that the variability of their emissions is sufficiently small to allow accurate reduction of data based upon computing averages from equally spaced data points over the averaging period).
- 17.2.2 Alternative methods of converting pollutant concentration measurements to the units of the emission standards.

## **SECTION 18 Special Consideration**

The District may provide for approval, on a case-by-case basis, of alternative monitoring requirements different from the provisions of this regulation if the provisions of this regulation (i.e., the installation of a continuous emission monitoring system) cannot be implemented by a source due to physical plant limitations or extreme economic reasons. In such cases, when the District exempts any source subject to this regulation by use of this provision from installing continuous emission monitoring systems, the District shall set forth alternative emission monitoring and reporting requirements (e.g., periodic manual stack tests) to satisfy the intent of these regulations. Examples of such special cases include, but are not limited to, the following:

- 18.1 Alternate monitoring requirements may be prescribed when installation of a continuous monitoring system or monitoring device specified by this regulation would not provide accurate determinations of emissions.
- 18.2 Alternate monitoring requirements may be prescribed when the affected facility is infrequently operated.
- 18.3 Alternative monitoring requirements may be prescribed when the District deems that the requirements of this regulation impose an extreme economic burden on the source owner or operator. The burden of proof for an alleged "economic burden" is to be borne by the source.

18.4 Alternative monitoring requirements may be prescribed when the District deems that monitoring systems prescribed by this regulation cannot be installed due to physical limitations at the facility.

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