REGULATION 6.07 Standards of Performance for Existing Indirect Heat Exchangers

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 provides for the control of emissions from indirect heat exchangers.

SECTION 1 Applicability

This regulation applies to each affected facility that was in being or commenced construction, modification, or reconstruction on or before the applicable classification date defined below.

SECTION 2 Definitions

Terms used in this regulation not defined herein shall have the meaning given them in Regulation 1.02.

- 2.1 "Affected facility" means an indirect heat exchanger having input capacity of more than one million BTU per hour.
- 2.2 "Classification date" means:
- 2.2.1 August 17, 1971 for affected facilities with a capacity of more than 250 million BTU per hour heat input; and
- 2.2.2 April 9, 1972 for affected facilities with a capacity of 250 million BTU per hour heat input or less.
- 2.3 "Indirect Heat Exchanger" means any piece of equipment, apparatus, or contrivance used for the combustion of fuel in which the energy produced is transferred to its point of usage through a medium that does not come in contact with or add to the products of combustion.

SECTION 3 Standard For Particulate Matter

No owner or operator of an affected facility shall cause to be discharged into the atmosphere from that affected facility particulate matter in excess of:

- 3.1 the rate specified in Table 1; or
- 3.2 20% opacity, except
- 3.2.1 Emissions from any indirect heat exchanger during building a new fire, cleaning the fire box, or blowing soot for a period or periods aggregating not more than ten minutes in any 60 minutes which are less than 40% opacity;
- 3.2.2 Emissions from waterwall spreader-stoker indirect heat exchangers during startup operations if the emissions do not exceed the following limits:
- 3.2.2.1 First 30 minutes 80% opacity;
- 3.2.2.2 Next hour 60% opacity; and
- 3.2.2.3 Next 2¹/₂ hours 40% opacity; or
- 3.2.3 Emissions up to 40% opacity from all other waterwall indirect heat exchangers for any 30-minute period during startup operations.

SECTION 4 Standard for Sulfur Dioxide

- 4.1 No owner or operator of an affected facility shall cause to be discharged into the atmosphere from that affected facility any gases that contain sulfur dioxide in excess of the rates listed in Table 2.
- 4.2 When different fuels are burned simultaneously in any combination, the applicable standard shall be determined by proration using the following formula:

$$E = \frac{ya + zb}{y + z}$$

where:

- E = Allowable sulfur dioxide emissions in pounds per million BTU heat input
- y = the percent of total heat input derived from liquid fuel.
- a = the allowable sulfur dioxide emission in pounds per million BTU heat input derived from liquid fuel.
- z = the percent of total heat input derived from solid fuel.
- b = the allowable sulfur dioxide emission in pounds per million BTU heat input derived from solid fuel.
- 4.3 Compliance shall be based on the total heat input from all fuels burned, including gaseous fuels.

SECTION 5 Test Methods and Procedures

- 5.1 The reference methods in 40 CFR Part 60 Appendix A, except as provided in Regulation 1.04, shall be used to determine compliance with the standards prescribed in section 3, and 4 as follows:
- 5.1.1 Method 1 for selection of sampling site and sampler traverses;
- 5.1.2 Method 3 for gas analysis to be used when applying Reference Method 5, and 6;
- 5.1.3 Method 5 for concentration of particulate matter and the associated moisture content;
- 5.1.4 Method 6 for concentration of sulfur dioxide;
- 5.2 For Method 5,
- 5.2.1 the sampling time for each run shall be at least 60 min;
- 5.2.2 the minimum sampling volume shall be 0.8 dscm (30 dscf) except that smaller process variables or other factors, may be approved by the District; and
- 5.2.3 the probe and filter holder heating systems in the sampling train shall be set to provide a gas temperature no greater than $160 \circ C$ ($320 \circ F$).
- 5.3 For Method 6
- 5.3.1 Method 1 shall be used to select the sampling site and the number of traverse sampling points. The sampling point in the duct shall be at the centroid of the cross section or at a point no closer to the walls than 1 m (3.28 ft). The sample shall be extracted at a constant rate of 1 liter/min, approximately.
- 5.3.2 Minimum sampling time shall be 20 minutes and the minimum sampling volume shall be 0.02 dscm (0.71 dscf) for each sample. The arithmetic mean of 2 samples shall constitute one run. Samples shall be taken at approximately 30 minute intervals.
- 5.3.3 For each run using the methods in sections 5.1.1, 5.1.2, and 5.1.3, the emissions

expressed in g/million cal (lb/million BTU) shall be determined by the following procedure:

$$E = \frac{20.9CF}{20.0 - \% \text{ oxygen}}$$

where

- E = pollutant emission g/million cal (lb/million BTU).
- C = pollutant concentration, g/dscm (lb/dscf), determined by Method 5, 6, or 7.
- F = a factor as determined in 40 CFR 60.45(f).

% oxygen = oxygen content by volume (expressed as percent). dry basis. Percent oxygen shall be determined by using the integrated or grab sampling and analysis procedures of Method 3 as applicable. The sample shall be obtained as follows:

- 5.3.3.1 For determination of sulfur dioxide emissions the oxygen sample shall be obtained simultaneously at the same point in the duct as used to obtain the samples for Methods 6 determinations:
- 5.3.3.2 For determination of particulate emissions, the oxygen shall be obtained simultaneously by traversing the duct at the same sampling location used for each run of Method 5 under section 5.2. Method 1 shall be used for selection of the number of traverse points except that no more than 12 sample points are required.
- 5.4 When combination of fossil fuels are fired, the heat input, expressed in cal/hr (BTU/hr), shall be determined during each testing period by multiplying the gross calorific value of each fuel fired by the rate of each fuel burned. Gross caloric value shall be determined in accordance wit ASTM methods D2015-66(72) (solid fuels) D240-76 (liquid fuels), or D1826-64(70) (gaseous fuels) as applicable. The rate of fuels burned during each testing period shall be determined by suitable methods and shall be confirmed by a material balance over the steam generation systems.

Adopted v1/4-19-72; effective 4-19-72; amended v2/9-1-76, v3/6-13-79; v4/01-17-18.

	Date Submitted	Date Approved	Federal Register
Original Reg:	06/29/79	01/25/80	45 FR 6092
1st Revision:	07/20/99	10/23/01	66 FR 53658
2nd Revision	03/23/18	10/1/19	84 FR 52003

Table 1 To Regulation 6.07

Allowable Particulate Emission Rates

Heat Input MM Btu/Hour	Maximum Particulate Emission Rates Pounds per Million Btu Input	
10 or less	0.56	
50	0.38	
100	0.33	
250	0.26	
500	0.22	
1,000	0.19	
2,500	0.15	
5,000	0.13	
7,500	0.12	
10,000 or more	0.11	

Interpolation of allowable emissions for intermediate heat input values not specified above may be accomplished by use of the equation shown below for the appropriate fuel and heat input range specified:

$$Y = 0.9634 \text{ X}^{-0.2356}$$

where

X = millions of BTU per hour heat input

Y = allowable particulate emissions in pounds per million BTU heat input.

Table 2 To Regulation 6.07

Allowable Sulfur Dioxide Emissions Based On Heat Input Capacity

MM Btu/Hour Heat Input	Pounds SO ₂ per Million Btu Heat Input Liquid or Gaseous Fuel Solid Fuel	
10 or less	1.0	4.0
50	1.0	2.2
100	1.0	1.7
150	1.0	1.4
200	0.9	1.3
250 or more	0.8	1.2

Interpolation of allowable emissions for intermediate heat input values not specified in the table may be accomplished by use of the following equations for appropriate fuel and heat input specified:

Liquid or Gaseous Fuel: $Y = 7.722 X^{-0.4106}$

Solid Fuel:

 $Y = 9.46 X^{-0.3740}$

where:

Y = allowable sulfur dioxide emissions in pounds per million BTU heat input.

X = millions of BTU per hour heat input capacity rating.