

Overview of the Boiler MACT and Strategies for Compliance

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Overview

- Major source status and applicability issues
- Emission limits and work practice standard
- Testing, fuel analysis, and initial compliance requirements

Overview

- Continuous compliance requirements
- Notifications, reports, and recordkeeping requirements
- Compliance options
- Strategies for cost-effective compliance

Introduction

- EPA published final NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters on September 13, 2004 (40 CFR Part 63, Subpart DDDDD)
- Affects existing, reconstructed, and new boilers/process heaters at facilities that are major HAP sources

Introduction

- Boiler MACT contains emission limits and work practice standards
- Boiler MACT contains testing, monitoring, recordkeeping, and reporting requirements
- Requirements depend on boiler size and fuel type, and whether the unit is new or existing

Introduction

There are a *myriad* of Boiler MACT compliance options, including performance testing, fuel analysis, work practice standards, emissions averaging, and health-based eligibility demonstrations

Applicability and Key Definitions

- Affects existing, reconstructed, and new boilers/process heaters at facilities that are major HAP sources.
- A boiler/process heater is considered *new* if construction is commenced after January 13, 2003.

Applicability and Key Definitions

- A boiler/process heater is classified as *reconstructed* if it meets the criteria defined in 40 CFR 63.2 and reconstruction commences after January 13, 2003
- A boiler/process heater is defined as *existing* if it is not new or reconstructed

Compliance Deadlines

- *New* units at major sources: November 12, 2004 or upon startup, whichever is later
- *Existing* units at major sources: September 13, 2007

Compliance Deadlines

- Units at area sources that become major sources:
 - new/reconstructed units: upon startup
 - existing units within 3 years after facility becomes a major source

Boiler MACT Exemptions

- Municipal waste combustors
- Hospital waste incinerators
- Commercial/industrial solid waste incinerators
- Hazardous waste boilers

Boiler MACT Exemptions

- Fossil-fuel fired electric utility steam generating units > 25 MW
- Boilers/process heaters used for R & D
- Ethylene cracking furnaces covered by 40 CFR 63, Subpart YY

Boiler MACT Exemptions

- Blast furnace stoves and BFG-fired boilers/process heaters
- Temporary boilers

Subpart DDDDD Definitions

- *Large*: rated capacity > 10 MMBtu/hr
- *Small*: < 10 MMBtu/hr

Subpart DDDDD Definitions

- *Solid Fuel* Units: Burn any amount of solid fuel, either alone in with liquid or gaseous fuels
- *Liquid Fuel* Units: Burn any amount of liquid fuel alone or with any gaseous fuels
- *Gaseous Fuel* Units: Burn only gaseous fuels

Summary of Boiler MACT Emissions Limits and Work Practice Standards

Fuel Category	Pollutant	Large Units		Limited Use Units		Small Units	
		New	Existing	New	Existing	New	Existing
Solid	PM	0.025	0.07	0.025	0.21	0.025	-
	(or TSM)	0.0003	0.001	0.0003	0.004	0.0003	-
	HCl	0.02	0.09	0.02	-	0.02	-
	Hg	3E-06	9E-06	3E-06	-	3E-06	-
	CO	400 ppm	-	400 ppm	-	-	-
Liquid	PM	0.03	-	0.03	-	0.03	-
	HCl	0.0005	-	0.0009	-	0.0009	-
	CO	400 ppm	-	400 ppm	-	-	-
Gaseous	CO	400 ppm	-	400 ppm	-	-	-

Note: PM, TSM, HCl, and Hg emission limits are expressed as lb/MMBtu heat input and CO emission limits are expressed as ppm by volume on a dry basis.

Boiler MACT Operating Limits for Different Control Systems

- Maintain certain minimum control device operating parameter values established during performance testing
- Install and operate a bag detection system for fabric filter control
- Maintain plume opacity below certain specified levels

Boiler MACT Fuel Analysis Compliance Options

- Maintain fuel type or fuel mixture such that calculated Hg, TSM, and/or HCl emission rates are below the applicable emission limits

General Compliance Requirements

- Startup, shutdown, and malfunction plan (SSMP)
- Site-specific monitoring plan for performance testing option

Compliance Alternatives for Large, Solid Fuel Boilers: Fuel Analysis

- Develop site-specific fuel analysis plan
- Obtain 3 composite fuel samples for each fuel type
- Calculate Hg, TSM, and/or HCl emission rates based on the 90th percentile confidence level fuel pollutant concentration (lbs/MMBtu)

Compliance Alternatives for Large, Solid Fuel Boilers: Fuel Analysis

- Continuous compliance demonstrated by maintaining fuel Hg, TSM, and Cl contents below established limits
- Recordkeeping and semiannual reporting

Compliance Alternatives for Large, Solid Fuel Boilers: Emission Averaging

- Weighted average emissions from the boilers participating in the emissions averaging option must be in compliance with the applicable emission limits

Compliance Alternatives for Large, Solid Fuel Boilers: Emission Averaging

- Emission averaging implementation plan
- Continuous compliance demonstrated by calculating 12-month rolling average weighted emission limit using actual heat input
- Semiannual compliance reporting

Compliance Alternatives for Large, Solid Fuel Boilers: Health-Based Compliance Alternatives

- Appendix A of Subpart DDDDD
- Conduct HAP emissions tests or fuel analyses for every emission point subject to rule that can emit HCl or CL2 (for HCl demonstration) and Manganese (for TSM demonstration)

Compliance Alternatives for Large, Solid Fuel Boilers: Health-Based Compliance Alternatives

- Determine maximum hourly emission rate for each emission point
- Use either look-up table in Appendix A or conduct a site-specific compliance demonstration using an accepted risk assessment methodology (Hazard Index < 1)

Compliance Alternatives for Large, Solid Fuel Boilers: Health-Based Compliance Alternatives

- Submit compliance demonstration no later than one year before compliance date

Boiler MACT Compliance Strategies

1. Define Major Source Status:

- Development of a comprehensive HAP emission inventory
- Site-specific source test and materials analysis data
- Recent industry source test data and updated emission factors
- Emissions variability (e.g., solid fuels)

Boiler MACT Compliance Strategies

2. Verification of Current Emission Rates

- Stack testing and/or fuel analysis
- Determine levels of control needed

Boiler MACT Compliance Strategies

3. Evaluation of Potential Compliance Options

- Performance testing
- Fuel analysis
- Work practice standards
- Emission averaging
- Health-based eligibility demonstrations

Boiler MACT Compliance Strategies

4. Economic Evaluation of Boiler Controls, Fuel Supply Changes, and Boiler Replacement
 - Type and number of pollutants to be controlled
 - Level(s) of control needed
 - Boiler design, age, and remaining useful life
 - Facility steam demand

Boiler MACT Compliance Strategies

4. Economic Evaluation of Boiler Controls, Fuel Supply Changes, and Boiler Replacement
 - Possible fuel supply limitations
 - Site-specific equipment installation needs
 - Interface issues (e.g., space, utilities, outage needs, stacks, waste treatment, etc.)

Boiler MACT Compliance Strategies

4. Economic Evaluation of Boiler Controls, Fuel Supply Changes, and Boiler Replacement
 - Existing controls
 - Control requirements and costs of future regulatory programs
 - Costs and operating advantages of fuel changes and boiler/process heater replacement

Boiler MACT Compliance Strategies

5. Compliance Strategy Development
 - Evaluation of alternative compliance options and economic factors involving control equipment installation, fuel supply changes, and boiler replacement

Boiler MACT Compliance Strategies

5. Compliance Strategy Development

- Timeline of compliance activity milestones and regulatory compliance dates
- Resource allocation for planning, capital purchases, permitting, construction, etc.

SUMMARY AND CONCLUSIONS