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**New Air Quality Requirements for Facilities with Boilers**

F. Jason Martin, PE, ASCE Member<sup>1</sup>

<sup>1</sup>Short Elliott Hendrickson, 809 North 8<sup>th</sup> Street, Suite 216, Sheboygan, WI 53081; PH (920) 452-6603; FAX (920) 452-6635; email: [jmartin@sehinc.com](mailto:jmartin@sehinc.com)

***Abstract***

The rule affects any new or existing boiler and process heater located at a facility that is a major source of hazardous air pollutants (HAPs). According to the Clean Air Act, a facility that has the potential to emit 10 tons a year or more of a single HAP, or 25 tons or more of a combination of HAPs is considered a major source. The rule applies to units that combust solid, liquid, and gaseous fuels, with few exemptions. The U.S. Environmental Protection Agency (EPA) has estimated that 58,000 existing boilers and process heaters are subject to this rule. According to the rule language, new boilers and process heaters must be in compliance on the effective date of the final rule or upon start-up, whichever is later. Existing sources must come into compliance with the rule within three years of its effective date. The rule sets limits on the amount of air pollution that may be released from the boilers, creates performance test requirements, and recordkeeping requirements.

***Background***

Under Section 112(d) of the Clean Air Act of 1990 (CAA), the EPA is required to develop national emission standards for hazardous air pollutants (NESHAP) for source categories. These rules require the application of strict controls known as maximum achievable control technology (MACT), and thus the new rule is commonly known as the “Boiler MACT”. The EPA has determined that industrial/commercial/institutional boilers are major sources for emissions of one or more of the HAPs listed in Section 112(b) of the CAA, and thus developed a NESHAP for those boilers. The EPA has previously issued rules known as New Source Performance Standards (40 CFR Part 60, Subparts D, Da, Db, and Dc) to address boiler emissions of criteria pollutants; the NESHAP only addresses HAP emissions.

The EPA issued a proposed NESHAP for Industrial/Commercial/Institutional Boilers and Process Heaters on January 13, 2003 (68 FR 1660-1763). The rule was finalized on February 26, 2004 and is still awaiting publication in the Federal Register as of March 25, 2004. The rule will be codified in 40 CFR Part 63, Subpart DDDDD.

### ***Rule Applicability***

The rule applies to all new, reconstructed, and existing industrial, institutional, and commercial boilers and process heaters that are located at a major source of HAPs. Sources excluded from this rule include blast furnace stoves, temporary boilers, blast furnace gas fuel-fired boilers, waste heat boilers, boilers used in research and development, and any boiler or process heater that is already regulated, or will be subject to regulation, under a different MACT standard. Facilities that are subject to this rule must meet the emission limits, testing requirements, and recordkeeping requirements described below.

### ***Requirements***

Due to the wide variety of boilers and process heaters, the EPA categorized them into nine subcategories for regulation, as shown in Figure 1.

#### **Figure 1: Boiler and Process Heater Subcategories**

Subcategories based on fuel type

- Solid fuel-fired units
- Liquid fuel-fired units
- Gaseous fuel-fired units

Within each fuel type subcategory there are three

Subcategories based on size/use

- Large (Greater than 10 MMBtu/hr heat input)
- Small (Less than 10 MMBtu/hr heat input)
- Limited-Use (utilized less than 10% of capacity)

The rule contains requirements for operating limits, work practices, performance tests, monitoring, recordkeeping, reporting, and emission controls. The applicability of these requirements depends on which of the nine subcategories a given source belongs to. Additionally, sources are divided into new or reconstructed, and existing. Existing sources were installed on or before January 13, 2003; all other units fall into the new or reconstructed classification. Gas fired units are allowed to burn liquid fuel during periods of gas curtailment or gas supply emergencies, without jeopardizing their gaseous fuel designation. The 10 MMBtu/hr size demarcation is equivalent to approximately 300 horsepower or 10,300 lb/hr steam. Based on this definition, industrial boilers generally fall into the “large” category, while residential and commercial boilers generally fall into the “small” category.

### **Emission Limits/Control Technology**

The requirements for all MACT standards, including this rule, are based on the level of control achieved by the best-controlled sources within a given source category. For the purposes of this rule, the source category included industrial/commercial/

institutional boilers and process heaters with emission controls. Within each subcategory two MACT levels were set; one for existing sources and one for new sources. Existing sources must meet the average emission control provided by the best performing 12% of existing sources, and new sources must meet the emission control achieved in practice by the best-controlled similar source.

The rule sets emission limits for five pollutants: particulate matter (PM), total selected metals, hydrogen chloride, mercury, and carbon monoxide (CO). The total selected metals, hydrogen chloride (HCl), and mercury (Hg) are HAPs. Particulate matter and CO are included as easily measured surrogates for HAPs. PM is available as a surrogate indicator of total selected metals emissions. HCl is a surrogate indicator for a variety of inorganic HAPs. CO is a surrogate indicator for organic HAPs. Their relevant emission limits are provided in Table 1.

<b>Table 1 Emission Limits and Work Practice Standards</b>						
	Emission Limits (lb/MMBtu)					
Subcategory	PM	or <sup>1</sup>	Metals	HCl	Hg	CO
<b>New Source</b>						
Solid Fuel, Large	0.025	or	0.0003	0.02	0.000003	400
Solid, Small	0.025	or	0.0003	0.02	0.000003	NA
Solid, Limited Use	0.025	or	0.0003	0.02	0.000003	400
Liquid Fuel, Large	0.03		NA	0.0005	NA	400
Liquid, Small	0.03		NA	0.0009	NA	NA
Liquid, Limited Use	0.03		NA	0.0009	NA	400
Gaseous Fuel, Large	NA		NA	NA	NA	400
Gaseous, Small	NA		NA	NA	NA	NA
Gaseous, Limited Use	NA		NA	NA	NA	400
<b>Existing Source</b>						
Solid Fuel, Large	0.07	or	0.001	0.09	0.000009	NA
Solid, Small	NA		NA	NA	NA	NA
Solid, Limited Use	0.21	or	0.004	NA	NA	NA
Liquid Fuel, All	NA		NA	NA	NA	NA
Gaseous Fuel, All	NA		NA	NA	NA	NA
<sup>1</sup> – Solid fuel sources can select to comply with either the PM or Metals limit NA – Not Applicable, no limit set in rule Metals (Total Selected Metals) include arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium						

The EPA identified control technologies that the best performing sources use to achieve the emission limits shown in Table 1, and set these technologies as a MACT level equivalent to the emission limits described above. The MACT control technologies are provided in Table 2.

### **Operating Limits**

As described above, the EPA has provided some flexibility in meeting the MACT emission limits. The regulated facilities are allowed to use any control technology or

technique to meet the emission limits. However, the selection of control technology will determine the operating limits that are imposed on the operation. If a facility

<b>Table 2 MACT Control Technologies</b>				
Subcategory	Non-mercury metallic HAPs	Mercury	Inorganic HAPs	Organic HAPs
<b>New Source</b>				
Solid Fuel, Large	Fabric Filter	Fabric Filter	Packed bed scrubber	CO monitoring
Solid, Small	Fabric Filter	Fabric Filter	Wet scrubber	CO monitoring
Solid, Limited Use	Fabric Filter	Fabric Filter	Wet scrubber	NA
Liquid Fuel, Large	Electrostatic precipitator	NA	Packed bed scrubber	CO monitoring
Liquid, Small	Electrostatic precipitator	NA	Wet scrubber	CO monitoring
Liquid, Limited Use	Electrostatic precipitator	NA	Wet scrubber	NA
Gaseous Fuel, Large	NA	NA	NA	CO monitoring
Gaseous, Small	NA	NA	NA	NA
Gaseous, Limited Use	NA	NA	NA	CO monitoring
<b>Existing Source</b>				
Solid Fuel, Large	Fabric Filter	Fabric Filter	Wet or dry scrubber	NA
Solid, Small	NA	NA	NA	NA
Solid, Limited Use	Fabric Filter or electrostatic precipitator	NA	NA	NA
Liquid Fuel, All	NA	NA	NA	NA
Gaseous, All	NA	NA	NA	NA
NA – Not Applicable, no limit is set in the rule CO – Carbon monoxide				

elects to use a control technology other than those listed in Table 2, they must operate with additional operating limits.

Readers are directed to Tables 2, 3, and 4 of the rule for details on the specific operating limits that are imposed for each combination of unit subcategory and control device.

### **Work Practices**

The EPA included only one work practice requirement in the regulation, which is CO monitoring. Another work practice, “good combustion practices”, was considered for inclusion, but was excluded from the regulation based on a determination that operators have an economic incentive to operate efficiently in order to conserve fuel. The CO monitoring work practice only applies to new sources in the large and limited use subcategories, which must meet a CO emission limit of 400 parts per million. Solid fuel sources must correct to 7 percent oxygen, while other sources must correct to 3 percent oxygen. The subcategories subject to CO monitoring are shown in Table 2.

### **Performance Tests**

Facilities with boilers and process heaters that are required to meet an emission limit must perform initial and annual performance stack tests or fuel analysis. Existing units in the small solid fuel subcategory and in any of the liquid or gaseous fuel subcategories do not have applicable emission limits, and therefore are not required to conduct stack tests.

The stack tests measure concentration of PM (or total selected metals), mercury, and HCl. The first annual test must be performed between 10 and 12 months after the initial performance test and subsequent annual tests must be performed every 12 months thereafter. The frequency of annual testing may be extended to a 3-year period if three consecutive years of testing have shown compliance with emission limits.

### **Monitoring**

The rule requires that a site specific monitoring plan be developed for each monitoring system. Each monitoring plan must address the following:

- Ensure that continuous monitoring system devices are located such that measurements are representative of controlled exhaust emissions
- Performance and equipment specifications for the sample interface, the pollutant concentration or parametric signal analyzer, and the data collection and reduction systems
- Performance evaluation procedures and acceptance criteria
- Operation and maintenance procedures
- Data quality assurance procedures
- Recordkeeping and reporting procedures
- A written startup, shutdown, and malfunction plan

### **Recordkeeping**

All required records must be available for expeditious review for a period of 5 years. The records must be kept on-site for the first 2 years, and may be kept off-site for the remaining 3 years. The list of required records is provided in §§63.7555 of the rule.

### **Notification and Reporting**

There are no notification or reporting requirements for existing small gas, small liquid, or small solid fuel units. The rule requires that other facilities submit the following notifications:

- Initial notification within 120 calendar days of becoming subject to this rule
- Notification of intent to conduct performance test and/or compliance demonstration at least 60 calendar days before such activity occurs
- Notification of compliance status 60 calendar days following completion of performance test and/or compliance demonstration
- All notifications required by the General Provisions that apply to the source

The rule identifies two types of required reports, including:

- Semi-annual compliance reports
- An immediate report if you have a startup, shutdown, or malfunction that is not consistent with your startup, shutdown, and malfunction plan

### **Dates**

It is anticipated that this rule will be published in April 2004. In addition to the deadlines described above for notification and reporting, sources have deadlines to conduct performance tests, set operating limits, and conduct monitoring equipment performance evaluations. Existing sources will have three years from the date of publication to meet these requirements. New and reconstructed sources must meet these requirements on the rule publication date or upon startup, whichever is later. All sources have until 180 days after their compliance date to demonstrate compliance.

In addition, Title V operating permits must be amended to reflect this rule. Sources with permits less than 3 years old must amend their permits; sources with less than 2 years remaining in their permit must incorporate this rule into the next renewal of their permit.

### **Summary**

The EPA identified industrial/commercial/institutional boilers and process heaters as major sources of HAP emissions and thus promulgated a NESHAP for these sources. This rule requires that facilities with these sources, which are major sources of HAPs, meet emission standards reflective of the application of MACT. It is notable that existing small gas, liquid, and solid fuel boilers and process heaters are not subject to any requirements in the rule. Facilities that are subject to this rule must meet the emission limits, testing requirements, recordkeeping requirements, and reporting requirements applicable to the subcategory that their source belongs to. The rule is required by Section 112(d) of the Clean Air Act and will enhance air quality by reducing HAP emissions.

### **References**

Federal Register, Volume 68, No. 8, January 13, 2003, 1660-1763.  
40 CFR 63, Subpart DDDDD