

New England Healthcare Engineers' Society

**Recently Promulgated National
Air Quality Regulations and
How They Will Impact Hospitals**

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Presentation Overview

- **Air Emission Basics**
- **New Federal Boiler Regulations**
- **Questions**

Air Emission Basics

- Criteria Pollutants

- Products of combustion: Nitrogen Oxides (NO_x), Carbon Monoxide (CO), Sulfur Dioxide (SO₂), Particulate Matter (PM) and Volatile Organic Compounds (VOC) or Non-methane hydrocarbons (NMHC)

- The Clean Air Act (CAA) requires EPA to identify sources of Hazardous Air Pollutants (HAPs) and develop regulations to limit these emissions.

- Boilers, Incinerators and Reciprocating Internal Combustion Engines

- Hazardous Air Pollutants

- List of 187 HAPs from the CAA can be found at <http://www.epa.gov/oar/toxicair/newtoxics.html>

Air Emission Basics (continued)

- EPA has developed both Major and Area Source National Emission Standards for Hazardous Air Pollutants (NESHAPs) promulgated under 40 CFR 63
- Major vs. Area Sources
 - Major sources have the Potential to Emit (PTE) greater than **10 tpy** individual HAP and **25 tpy** combined HAPs
 - Area sources are facilities that are not major sources - who do not have PTE above these levels either due to permit limitations or design capacity.
- Majority of Sources in NH are Area Sources

Hospital Specifics

- Hospitals in NH are **area sources** of HAPs based on the boilers and emergency generators currently permitted.
 - To determine your facility's classification, you must calculate your PTE of HAPs from all devices at your facility (boilers, emergency generators, ethylene oxide sterilizers, etc.)
- Hospitals typically burn **traditional fuels** in their boilers (coal, biomass, oil or gas) as opposed to solid waste.
 - Presentation today is not covering HIMWI (none in NH – few, if any, in New England).
- Almost 97% of the hospitals in NH burn **fuel oil** alone or in combination with natural gas.
- One facility in NH operates 2 small (<10 MMBtu/hr) biomass boilers.
- Over 70% have at least one boiler **>10 MMBtu/hr.**

New Federal Boiler Regulations

Overview of recent EPA actions affecting boilers

EPA issued three rules that reduce emissions of HAPs:

- NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters (40 CFR 63, Subpart DDDDD) (“Boiler MACT”)
- **NESHAP for Area Sources: Industrial, Commercial, and Institutional Boilers (40 CFR 63, Subpart JJJJJJ) (“Boiler Area Source Rule”)**
- Section 129 NSPS and Emission Guidelines for Commercial and Industrial Solid Waste Incinerators (CISWI)

EPA also issued a final rule that defines “solid waste”

- Necessary to determine whether a source must meet boiler standards or an incinerator standard

Overview of recent EPA actions affecting boilers (cont.)

■ Schedule

- Proposals signed on April 29, 2010
- Published in the **Federal Register** on **June 4, 2010**
- Promulgations signed on February 21, 2011 (Court-ordered)
- Published in the **Federal Register** on **March 21, 2011**
- Effective Date: May 20, 2011

■ EPA has initiated reconsideration of certain aspects of the boiler and CISWI rules

- Some of the comments raise difficult technical issues that would benefit from additional public involvement.
- Stakeholders have petitioned for reconsideration of other issues.

■ Stay

- On May 18, 2011, EPA delayed the effective date of the Boiler MACT and CISWI

■ **Boiler Area Source Rule and Solid Waste Definition are in effect even during the reconsideration process.**

- Facilities need to comply with rules as they were promulgated.

Focus of Today's Presentation:

Boiler Area Source Rule

Area Sources burning Traditional Fuel (oil)

Boiler Area Source Rule

- **Rule is broken down based on:**
- **Boiler size:**
 - Small (<10 MMBtu/hr)
 - Large (\geq 10 MMBtu/hr)
- **Fuel type:**
 - Coal-fired units
 - Biomass-fired units
 - Oil-fired units
- **Boiler Construction:**
 - Existing prior to June 4, 2010
 - New or reconstructed after June 4, 2010

Are any boilers not subject to this subpart?

- Any boiler covered by another part of 40 CFR 63
- Any boiler covered by CISWI
- Hazardous waste boilers
- A boiler that is used specifically for research and development.
 - This exemption does not include boilers that solely or primarily provide steam (or heat) to a process or for heating at a research and development facility.
- Any boiler that is used as a control device to comply with another Subpart of 40 CFR 63, provided that at least 50 percent of the heat input to the boiler is provided by the gas stream that is regulated under another subpart.

Are any boilers not subject to this subpart? (continued)

- A hot water heater as defined in this subpart.
 - **Hot water heater** means a closed vessel with a capacity of no more than 120 U.S. gallons in which water is heated by combustion of gaseous or liquid fuel and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, ... and ... water temperatures exceeding 210°F.
- A gas-fired boiler as defined in this subpart.
 - **Gas-fired boiler** includes any boiler that burns gaseous fuels not combined with any solid fuels, burns liquid fuel only during periods of gas curtailment, gas supply emergencies, or periodic testing on liquid fuel. Periodic testing of liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

Fuel Switching Rule Provisions

- A boiler is a **new** affected source if you commenced fuel switching from natural gas to solid fossil fuel, biomass, or liquid fuel after June 4, 2010.
- If you intend to switch fuels, and this fuel switch may result in the applicability of a different subcategory or a switch out of Subpart JJJJJJ due to a switch to 100 percent natural gas, you must provide **30 days** prior notice of the date upon which you will switch fuels.
- If you own or operate an industrial, commercial, or institutional boiler and would be subject to this subpart except for the exemption for units covered by the CISWI rules, and you cease combusting solid waste, you must be in compliance with this subpart on the effective date of the waste to fuel switch.
- If you intend to commence or recommence combustion of solid waste, you must provide **30 days** prior notice of the date upon which you will commence or recommence combustion of solid waste.

Area Source Requirements – Oil and Biomass Units Only
Industrial, Commercial, and Institutional Boilers
 40 CFR Part 63, Subpart JJJJJJ

Do the Emission Limits Requirements Apply?

	Existing Oil Units	New Oil Units	Existing Biomass Units	New Biomass Units
≥ 10 MM Btu/hr	No	Yes	No	Yes
< 10 MM Btu/hr	No	No	No	No

Do I do a One-Time Energy Assessment?

	Existing Oil Units	New Oil Units	Existing Biomass Units	New Biomass Units
≥ 10 MM Btu/hr	Yes	No	Yes	No
< 10 MM Btu/hr	No	No	No	No

Do I do a Biennial (every other year) Tune-Up?

	Existing Oil Units	New Oil Units	Existing Biomass Units	New Biomass Units
≥ 10 MM Btu/hr	Yes	Yes	Yes	Yes
< 10 MM Btu/hr	Yes	Yes	Yes	Yes

Emission Limits for Area Source Boilers Oil and Biomass Only

Subcategory	Emission Limits	
	PM (lb/MMBtu)	
	10 – 30 MMBtu/hr	>30 MMBtu/hr
New Biomass	0.07	0.03
New Oil	0.03	0.03
Existing Biomass	-	-
Existing Oil	-	-

Energy Assessment

[40 CFR 63, Subpart JJJJJJ - Table 2]

- One-time energy assessment performed by a qualified energy assessor.
- An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements satisfies the energy assessment requirements.
- The energy assessment must include:
 - A visual inspection of the boiler system,
 - An evaluation of operating characteristics of the facility, specifications of energy using systems, operating and maintenance procedures, and unusual operating constraints,
 - Inventory of major systems consuming energy from affected boiler(s),
 - A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage,
 - A list of major energy conservation measures,
 - A list of the energy savings potential of the energy conservation measures identified,
 - A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.

Tune-up Requirement [63.11223(b)]

- As applicable, **inspect the burner**, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, but you must inspect each burner at least once every 36 months).
- **Inspect the flame pattern**, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.
- Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.
- **Optimize total emissions of carbon monoxide**. This optimization should be consistent with the manufacturer's specifications, if available.

Tune-up Requirement [63.11223(b)] (continued)

- **Measure the concentrations** in the effluent stream of **carbon monoxide** in parts per million, by volume, and **oxygen** in volume percent, **before and after the adjustments** are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).
- Maintain onsite and submit, if requested, **biennial report** containing the following information:
 - The concentration of CO in the effluent stream in ppm, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler.
 - A description of any corrective actions taken as a part of the tune-up of the boiler.
 - The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler.
- If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup.

Notifications and Reporting Timeline	Existing Biomass and Oil-Fired Boilers	
	<10 MMBtu/hr	≥10 MMBtu/hr
Initial Notification of Applicability Report	By September 17, 2011	
Initial Compliance Date	First biennial tune-up by March 21, 2012	
One Time Energy Assessment	NA	By March 21, 2014
Notification of Intent to Conduct a Performance Test	NA	NA
Initial Compliance Testing	NA	NA
Initial Notification of Compliance Status Report	By July 19, 2012	By July 19, 2012 for initial tune-up; By July 19, 2014 for one-time energy assessment
Continuing Compliance –Biennial Tune-up	Subsequent tune-ups should be completed no later than 25 months after the previous tune-up	
Continuing Compliance –Triennial Testing	NA	NA
Biennial Compliance Certification Report – Biennial Tune-up	Prepare first report by March 1, 2015 with subsequent reports prepared biennially by March 1 st	
Annual Compliance Certification Report	NA	NA

Notifications and Reporting Timeline	New Biomass and Oil-Fired Boilers Installed between 6/4/10 and 5/20/11	
	<10 MMBtu/hr	≥10 MMBtu/hr
Initial Notification of Applicability Report	By September 17, 2011	
Initial Compliance Date	First biennial tune-up by May 20, 2011	
One Time Energy Assessment	NA	NA
Notification of Intent to Conduct a Performance Test	NA	At least 60 days before performance stack test is scheduled to begin
Initial Compliance Testing	NA	By May 20, 2011
Initial Notification of Compliance Status Report	By September 17, 2011	Within 60 days of completing the performance test
Continuing Compliance –Biennial Tune-up	Subsequent tune-ups should be completed no later than 25 months after the previous tune-up	
Continuing Compliance –Triennial Testing	NA	No more than 37 months after the previous test
Biennial Compliance Certification Report – Biennial Tune-up	Prepare first report by March 1, 2012 with subsequent reports prepared biennially by March 1 st	
Annual Compliance Certification Report	NA	Prepare first report by March 1, 2012 with subsequent reports prepared annually by March 1 st

Notifications and Reporting Timeline	New Biomass and Oil-Fired Boilers Installed after 5/20/11	
	<10 MMBtu/hr	≥10 MMBtu/hr
Initial Notification of Applicability Report	Within 120 days of startup of the boiler	
Initial Compliance Date	First biennial tune-up upon startup	
One Time Energy Assessment	NA	NA
Notification of Intent to Conduct a Performance Test	NA	At least 60 days before performance stack test is scheduled to begin
Initial Compliance Testing	NA	Within 180 calendar days of startup
Initial Notification of Compliance Status Report	Within 120 days of startup of the boiler	Within 60 days of completing the performance test
Continuing Compliance –Biennial Tune-up	Subsequent tune-ups should be completed no later than 25 months after the previous tune-up	
Continuing Compliance –Triennial Testing	NA	No more than 37 months after the previous test
Biennial Compliance Certification Report – Biennial Tune-up	Prepare first report by March 1 st of the year immediately following startup of the boiler with subsequent reports prepared biennially by March 1 st	
Annual Compliance Certification Report	NA	Prepare first report by March 1 st of the year immediately following startup of the boiler with subsequent reports prepared annually by March 1 st

Notification and Reporting Guidance

- Sample Initial Notifications, Notifications of Compliance Status, and Tune-up Guidance and Example Recordkeeping Forms for Area Sources along with additional information about the Boiler Area Source Rule can be found at the NH DES website devoted to the Federal Boiler Rule at:

<http://des.nh.gov/organization/divisions/air/boiler-rule/index.htm>

- Send copies of paperwork to

EPA Region 1 US Environmental Protection Agency
5 Post Office Square, Suite 100, Mail code: OES04-2,
Boston MA 02109-3912
Attention: Air Clerk

and in the case of NH sources

New Hampshire Department of Environmental Services
Air Resources Division
Attention: Air Permitting Program
29 Hazen Drive; P.O. Box 95
Concord, NH 03302-0095

National and Regional EPA Contacts

Regulation	Contact	Office	Telephone Number	E-mail
Boiler MACT	Brian Shrager	USEPA Headquarters - OAQPS	(919) 541-7689	Shrager.brian@epa.gov
	Susan Lancey	USEPA – Region 1	(617) 918-1656	Lancey.susan@epa.gov
Boiler Area Source Rule	Jim Eddinger	USEPA Headquarters - OAQPS	(919) 541-5426	Eddinger.jim@epa.gov
	Susan Lancey	USEPA – Region 1	(617) 918-1656	Lancey.susan@epa.gov
CISWI	Toni Jones	USEPA Headquarters - NRCG	(919) 541-0316	Jones.toni@epa.gov
Solid Waste Definition	George Faison	USEPA Headquarters – RCRA	(703) 305-7652	Faison.george@epa.gov
	Jui-Yu Hsieh	USEPA - Region 1	(617) 918-1646	Hsieh.juiyu@epa.gov

Permitting Guidance

- NH Permit Applicability

Device	Design gross heat input (BTU/hr)	Fuel
External Combustion Device (Boiler)	$\geq 10,000,000$	Gaseous fuel, LPG, distillate fuel (#2 fuel oil) or diesel fuel, any combination
	$\geq 4,000,000$	#4 fuel oil
	$\geq 2,000,000$	Solid fuel, residual fuel (#6 fuel oil), used oil, any combination

- NH Permit Approaches

- Individual Permits (Temporary, State, Title V)

Questions?

Contact:

N.H. Department of Environmental Services

Air Resources Division

airpermitting@des.nh.gov

(603) 271-1370

(603) 271-1381 (fax)