

# EPA EMISSION RULES - BOILERS

## WHAT'S NEXT FOR OWNER AND OPERATORS?

On March 21, 2011 the U.S. Environmental Protection Agency published three rules regarding air emission standards in the Federal Register. Two of the rules pertain to boilers and are specifically designed to reduce emissions of air pollutants.

This material is intended for information only and it is not intended as legal advice

## WHAT ARE THE RULES?

- National Emission Standards for Hazardous Air Pollutants (NESHAP) for Major Sources: Industrial, Commercial and Institutional Boilers and Process Heaters (aka “The Boiler MACT”).
- NESHAP for Area Sources: Industrial, Commercial and Institutional Boilers, (“The Area Source Rule”). Notice process heaters not included.
- Third rule but doesn’t pertain to boilers (CISWI Commercial Industrial Solid Waste Incinerators).

## WHAT ARE THE RULES?

- Boiler = an enclosed device using controlled flame combustion having the primary purpose of recovering thermal energy in the form of steam or hot water.
- Controlled flame combustion = a steady state, or near steady state, process wherein fuel and/or oxidizer feed rates are controlled.
- Process Heater = enclosed device using controlled flame combustion having the primary purpose to transfer heat indirectly to a process material or to heat a transfer material for use in a process instead of generating steam.

## WHAT ARE THE RULES?

- The new rules target Hazardous Air Pollutants (HAPs) such as Hg, other metals, and toxic emissions like dioxins and furans.
- Existing regulatory standards only cover criteria pollutants (CO, PM, SO<sub>2</sub>, & NO<sub>x</sub>).
- 188 listed HAPs on EPA website.

[HAPs](#)

## MAJOR SOURCE or AREA SOURCE

- Major Source (BMACT) = any facility (site) that emits 10 or more tons per year of any individual HAP or 25 tons or more per year of any combination of HAPs.
- Area Source = any facility that emits < 10 tons per year of any individual HAP or < 25 tons per year of any combination of HAPs.  
In other words – Not a Major Source.

## MAJOR SOURCES (BMACT)

- Most of the major source boilers and process heaters are generally located at:
  - Very large industrial facilities
    - Refineries
    - Chemical plants,
    - Large manufacturing
  - Very large institutional facilities
    - Universities

## MAJOR SOURCES (BMACT)

- Estimated that there are close to 14,100 major-source boilers in the United States.
  - 80% Gas Fired
  - 6% Liquid Fuel Fired
  - 4.2% Coal Fired
  - 3% Bio-mass Fired
  - Other fuels include non-hazardous secondary materials like tire-derived fuel and wood residuals.

## AREA SOURCES

- Most of Area Source boilers are located at:
  - Commercial facilities (stores, malls, laundries, apartments, restaurants, hotels, motels, etc.).
  - Institutional facilities: Medical Centers (hospitals, clinics, nursing homes)
  - Religious and Educational (schools, churches)
  - Municipal Buildings (courthouses, prisons)
  - Industrial Sector (manufacturing facilities).



## AREA SOURCES

- Estimated there are approximately 187,000 area-source boilers in the United States.
  - 92% Liquid Fuel Fired
  - 6% Bio-mass Fired
  - 2% Coal Fired

## BRIEF HISTORY OF RULES

- Originally proposed in January 2003 NESHAP ICI Boilers & PHs
- Finalized in September 2004
- In 2005 Carried out reconsideration process, requested public comments, proposed amendments.
- In 2006 Finalized reconsideration.
- In July 2007 Vacated by Circuit Court of Appeals for the District of Columbia.
- Re-proposed in June 2010 (received over 4000 public comments).
- Finalized March 21, 2011.

## BRIEF HISTORY OF RULES

- In May 2011 EPA published a notice that delayed the implementation of the BMACT until reconsideration finalized. Area Source still in effect.
- In December 2011 Reconsideration process for the BMACT rule (stayed) and the Area Source Rule.
- In January 2012 – the delay notice was vacated by the U.S. District Court for the DC Circuit (BMACT in Effect).
- In February 2012 - No Action Assurance letter issued regarding certain notification deadlines in BMACT.

## BRIEF HISTORY OF RULES

- NAA letter – will not pursue enforcement action for any violations of the deadlines.
- BMACT NAA is in effect until December 31, 2012 or until the effective date of the final reconsideration rule.
- Again in March 2012 – No Action Assurance letter issued pertaining to certain deadlines of Area Source.

## WHAT DOES THIS MEAN?

- If Major Source – BMACT Rule Applies
- According to BMACT Rule ( § 63.7545) must file an “Initial Notification of Applicability”
- Determine Compliance Requirements based on
  - Existing Source vs. New Source
  - Subcategories
  - Size

## WHAT DOES THIS MEAN?

- Existing source means you commenced construction or reconstruction of the boiler or process heater on or before June 4, 2010.
- New source means you commenced construction or reconstruction of the boiler or process heater after June 4, 2010

## BMACT REQUIREMENTS

- EPA identified 11 different subcategories of boilers/process heaters (reconsideration rule 15) based on the design of various units. Each subcategory specific requirements.
- New & Existing natural gas and refinery gas units, a work practice established in lieu of numeric emission limits. Operator required to perform annual tune-up for units.

## BMACT REQUIREMENTS

- New & Existing units < 10 MMBtu/hr establishes a work practice in lieu of numeric emission limits. Operator required to perform a tune-up once every 2 years.
- New & Existing “limited use” boilers (operated < 10% of year as emergency or back up) establishes a work practice in lieu of numeric emission limits. Tune-up every 2 years.



# BMACT REQUIREMENTS

- All other New & Existing units (including coal and biomass) numeric emission limits established for: ([11 Subcategories](#) [15 Subcategories](#))
  - Hg
  - Dioxin
  - PM (as a surrogate for non-Hg metals)
  - HCl (as a surrogate for acid gases)
  - CO (as a surrogate for non-dioxin organic air toxics)

## BMACT REQUIREMENTS

- Demonstrate compliance with emission limits using performance testing, fuel analysis, or continuous monitoring systems (CMS) where applicable.
- Also includes various types of record keeping and report filing. Varies according to fuel type, size, & age such as tune up logs, records of fuel types, fuel analysis, corrective actions, performance tests, fuel switching, etc.
- Existing major source facilities are required to conduct a one-time energy assessment to identify cost-effective energy conservation measures.

# BMACT REQUIREMENTS

- Boilers not subject to this Rule
  - Hot Water Heaters
  - Temporary Boilers
  - Electric Utility Steam Generator
  - Boilers subject to other NESHAPs
  - Boilers used as control devices
  - R & D Boilers
  - Blast furnace gas fired
  - Boilers subject to Section 129 of the CAA
  - Waste Heat Boilers
  - Autoclaves

## BMACT COMPLIANCE DATES

- Initial Notification ( § 63.7545)
  - Existing sources - September 17, 2011
  - New Sources – 15 days after start-up
- Compliance Date ( § 63.7495)
  - Existing sources – March 21, 2014
  - New sources upon start-up or by May 20, 2011 (the later)
- NAA in effect for BMACT rule.

## AREA SOURCE RULE

- If Area Source – Area Source Rule Applies
- Must submit “Initial Notification Report”
- Determine Compliance Requirements
- Existing vs. New sources
- Based on fuel type
- Large or Small boiler

## AREA SOURCE RULE

- Existing & New – same as BMACT before or after June 4, 2010
- Fuel Sub Categories
  - Biomass
  - Coal
  - Oil
  - Gas
- Large Boiler – heat input  $\Rightarrow$  10 MMBtu/hr
- Small Boiler – heat input  $<$  10 MMBtu/hr

# AREA SOURCE REQUIREMENTS

- Establishes standards to address emissions of :
  - Hg
  - PM (as a surrogate of non-Hg metals)
  - CO (as a surrogate for organic air toxics)

## AREA SOURCE REQUIRMENTS - NEW

- New Boilers (Large => 10 MMBtu/hr)
  - Coal: must meet emission limits for Hg, PM, & CO
  - Biomass & Oil: must meet emission limits for PM
- New Boilers (Small < 10 MMBtu/hr)
  - Must perform boiler tune-up every two years.



# AREA SOURCE REQUIREMENTS

- Existing Sources ([Emission Limits](#))
  - Large ( $\Rightarrow$  10 MMbtu/hr) Coal fire boiler must meet emission limits for Hg & CO.
  - Biomass, Oil, and Small Coal fired boilers ( $<$  10 MMBtu/hr) are not required to meet emission limits but rather Work Practice Standard by performing a tune-up every two years.
  - All area source facilities with large boilers are required to conduct an energy audit assessment.

# AREA SOURCE REQUIREMENTS

## Boilers not subject to this Rule:

- Gas fired boilers (natural, process, landfill, coal derived, refinery, hydrogen, biogas) or liquid fuel during periods of curtailment, supply emergencies, or testing. Shall not exceed 48 hours per year.
- Hot water heaters
- R & D Boilers
- Boilers subject to other NESHAP standards
- Boilers used as control devices
- Boilers subject to Section 129 of the CAA
- Hazardous waste boilers
- Waste heat boilers

## AREA SOURCE COMPLIANCE DATES

- Initial Notification ( § 63.9(b)(2))
  - Existing Sources – September 17, 2011
  - New Sources – no later than September 17, 2011 or within 120 days after start up whichever later.
- Existing Sources
  - If subject to tune-up - March 21, 2012
  - If subject to emission limits – March 21, 2014
  - If subject to energy assessment – March 21, 2014
- New Sources – upon start up or May 20, 2011 whichever is later.

# AREA SOURCE REQUIREMENTS

- Demonstrate compliance based on requirements - includes record keeping and filing reports as before.
- EPA issued a No Action Assurance letter on March 13, 2012.
- Will not exercise enforcement of violations of existing boilers subject to tune ups only by March 21, 2012.
- NAA – in effect until October 1, 2012 or the effective date of a final rule addressing the proposed reconsideration.

# ENERGY ASSESMENTS

- Facilities with affected boilers / process heaters
  - Using  $< 0.3$  trillion Btu/year heat input = 1 day energy assessment. The boiler system and energy use system accounting for 50% of the energy output is evaluated.
  - Using 0.3 to 1.0 trillion Btu/year heat input = 3 day energy assessment. The boiler system and energy use system accounting for 33% of the energy output audited.
  - Using  $> 1.0$  trillion Btu/year heat input, the boiler system and any energy use system accounting for at least 20% of the energy output will be evaluated.

# ENERGY ASSESSMENTS

- Energy Use System includes:
  - Process heating
  - Compressed air systems
  - Machine drive (motors, pumps, fans)
  - Process cooling,
  - Facility heating, ventilation, & air condition systems
  - Hot water heating systems
  - Building envelop
  - Lighting

# ENERGY ASSESSMENTS

- Qualified Energy Assessor:
  - Someone who has demonstrated capabilities to evaluate energy saving opportunities in steam generation and major energy use systems:
    - Boiler combustion management
    - Boiler thermal energy recovery
    - Boiler blowdown thermal energy recovery
    - Primary energy resource selection
    - Insulation issues
    - Steam trap & steam leak management
    - Condensate recovery
    - Steam end-use management.

# ENERGY ASSESSMENTS

- Qualified Energy Assessor:
  - Capabilities and knowledge to perform assessment activities, data analysis, and report preparation.
  - Familiarity with operating & maintenance practices for steam and process heating systems.
  - Potential steam system improvements (improving steam turbines and reducing steam demand).
  - Effective utilization of waste heat.
  - Boiler-steam turbine cogeneration
  - Industry specific steam end-use systems.



# SUMMARIZING

- Major Source (BMACT)
  - Existing Sources – Comply by March 21, 2014. (Reconsideration proposed – probably bump compliance date to 3-years from publication of final rule).
  - New sources comply upon start-up.

# SUMMARIZING

- Area Source Rule
  - Existing sources subject to emission limits comply by March 21, 2014.
  - Existing sources subject to tune-ups comply by March 21, 2012 (reconsideration proposes March 21, 2013).
  - Existing sources subject to energy assessments comply by March 21, 2014.
  - New sources comply upon start-up.

# INFORMATION LINKS

- Industrial Combustion

- <http://www.ind-comb.com/banners/IC%20EPA%20Packet%20For%20LnD%20Website.pdf>

- EPA

- <http://www.epa.gov/ttn/atw/boiler/boilerpg.html>

- QUESTIONS

- THANK YOU



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