Proposed Area and Major Source Boiler NESHAP Overview

October 27, 2010

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Workshop Objectives:

Help Facilities Better Understand:

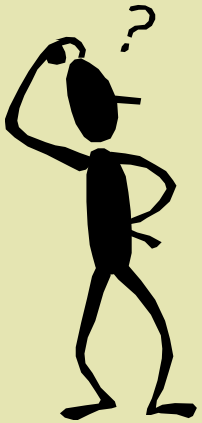
- Boiler NESHAP Requirements
- Applicability Status and Compliance Options
- Need to Develop a Long-Term Strategic Plan
- Comments Received on the Proposed Rules

The Proposed Revised/New Rules

- 40 CFR 63 Subpart DDDDD (Major Source Boiler & Process Heater MACT)
- 40 CFR 63 Subpart JJJJJJ (Area Source Boiler GACT)
- 40 CFR 241 – Concurrent Solid Waste Incinerator Definition Rule (CISWI)

Potential Questions:

- Are you Major for HAP's?
- Do You Burn a Solid Waste or Non-Traditional Fuel?
- Could a Single Site be Subject to Both NESHAP and CISWI?
- What Are Your Questions?



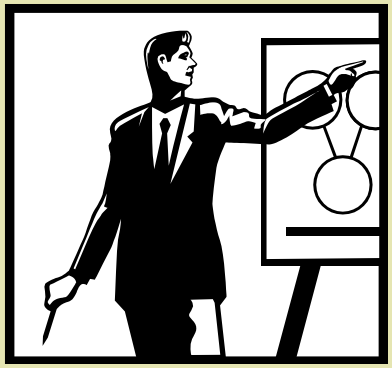
What is NESHAP?

- **Emissions standards for hazardous air pollutants (HAPs) in specific source categories**
- **HAPs know or suspected of causing cancer or other serious health effects; 187 identified**
- **Standards apply to Major and some Area Sources**
- **Technology based standards-Maximum Achievable Control Technology (MACT) Floor:**
  - Existing sources: Top 12 percent if 30 or more sources/facilities
  - New Sources: Best available control for that source
  - Area sources: EPA may use generally available control

Boiler NESHAP Overview

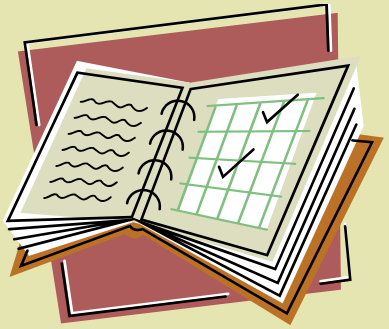
- **Proposed NESHAP Emission Limits are Potentially Very Restrictive for Existing Sources**
  - New Units (i.e. after June 4, 2010) Have Additional and/or Even Lower Emission Limits
- **Major Source Boiler MACT (Subpart DDDDD)**
  - Emission Limits are >65% LOWER Then Prior MACT
  - Additional Pollutants are Regulated
  - Fewer Compliance Options are Allowed
  - CO and/or PM CEMS Required Based on Source Capacity
  - Strongly Discourage the Use of Coal and Biomass!?
  - Very Extensive Add-on Controls Likely for Solid Fuel Boilers

Overview (continued)



- **Area Source Boiler GACT**
  - Outcome of Integrated Urban Air Toxic Strategy (Residual Risk)
  - CO and Mercury (Hg) Emission Limits for Existing Coal Boilers
  - CO Emission Limits for Biomass and Fuel Oil Boilers (even if Gas Backup)
  - CO CEMS for Boilers >$100x10^6$ BTU/hr Capacity
  - Work Practice Tune-Up Requirement for Non-Gaseous Fired Boilers <$10x10^6$ BTU/hr Capacity
  - "Beyond the Floor" Facility-Wide Energy Efficiency Assessment by Qualified Personnel

NESHAP Schedule!?



- **Proposed Rules Published on June 4, 2010**
- **Public Comment Period Ended August 3, 2010**
- **Court Ordered Final Rules Due by January 16, 2011**
- **Initial Notification Due to State and USEPA 120 Days After Promulgation**
- **Initial Compliance Date**
  - Existing Sources – 3 Years After Rule Promulgation
  - New Sources – At Rule Promulgation or Source Startup, whichever is Later
- **Notice of Compliance Status Report Deadline Dependent on Compliance Option, But No Later Then 240 Days After Initial Compliance Date**
- **Area Source Annual Compliance Report Due by March 1 Each Year**
- **What Permit Amendments Are Needed and When?**

HAP Emission Status

- **Major Source**
  - >10 TPY of a Single HAP or >25 TPY All HAP's Aggregated Together
  - Based on Site-Wide Worst Case Potential Emissions
  - Includes All Federally Enforceable Permit Limitations
  - No SIC Code Split as for PSD
- **Area Source is Not a Major Source of HAP's (i.e. <10/25 TPY)**

Site HAP Status Example

- **HAP Status is Dependent on Many Factors**

Actual HCl Emissions (@62,000 TPY Coal Usage)				
Coal Chlorine Content (ppm)	**100**	**300**	**600**	**900**
HCl TPY	**7.5**	**22.5**	**45**	**67**

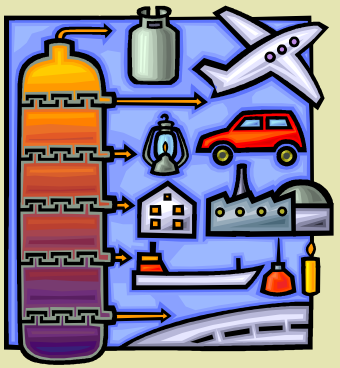
! Coal Hg Emissions are Also Extremely Variable!

Is HAP Area Source Status Feasible?

- What Fuel or Boiler Changes Needed?
- What Process Changes or Reformulation Needed?
- Are New or Retrofit Emission Controls Likely Required?
- How Long Will Boiler, Fuel, and/or Control Changes Take to Achieve?
- Can Fuel Vendors Provide a Content (e.g. Cl) Warranty?
- What Additional Data Needed to Support Decision Making?
- When Will/Should the Site Air Permit be Amended?
- What Are the Best Compliance Options to Maximize Operating Flexibility?
- What Are the Total Costs?

!A Long Term Strategic Compliance Plan Needs to be Developed!

Many NESHAP Subcategories



- **Fuel: Coal, Biomass, Liquid, and Gaseous Fuel Units**
  - 11 Subcategories Under Boiler MACT
  - 3 Subcategories Under Boiler GACT
- **Size: Large > 10 MMBTU/hr & Small ≤ 10 MMBTU/hr**
- **Use: Limited <10% Annual Capacity Factor**
- **Existing Versus New or Reconstructed Sources**
- **Emission Limits, Compliance Options and Requirements Differ Between Subcategories and for New vs. Existing Sources!**

Pollutants Covered by Boiler NESHAP'S

- **Major Source:**
  - PM as surrogate for non-mercury metallic HAP
  - HCl as surrogate for non-metallic inorganic HAP
  - CO as surrogate for non-dioxin organic HAP
  - Dioxin/Furans
  - Mercury (Hg)
- **Area Source**
  - PM as surrogate for non-mercury metallic HAP
  - CO as surrogate for organic HAP
  - Mercury

Emission Limit Example

Prior Versus Reissued Boiler MACT (Existing Coal Stoker Units) Pollutant (lbs/MM BTU)					
	PM	HCl	Hg	CO (ppm)	Dioxin (ng/dscm)
Prior	0.06	0.09	0.000009	NA	NA
Proposed	0.02	0.02	0.000003	50 (Corrected to 3% Oxygen)	0.003

? Do Most Current Coal Boilers Comply With Proposed Limits ?

? What Has US EPA Stated the "MACT Floor" Base Controls Are?

Emission Limit Example (continued)

Area Source vs. Major Source NESHAP (Existing Coal Units) Pollutant (lbs/MM BTU)					
	PM	HCl	Hg	CO (ppm)	Dioxin (ng/dscm)
Area Source	NA	NA	0.000003	310 (Daily Average Corrected to 7% Oxygen	NA
Major Source	0.02	0.02	0.000003	50 (Corrected to 3% Oxygen)	0.003
Significant Regulatory Advantage to Area Source HAP Status!!!					

Area Source Boiler GACT Emission Limits

(Pounds per million British thermal units heat input)				
Source	Subcategory	Particulate Matter (PM)	Mercury	Carbon Monoxide (CO) (ppm)
New Boiler	Coal	0.03	3.0E-06	310 (@ 7% oxygen)
	Biomass	0.03		100 (@ 7% oxygen)
	Oil	0.03		1 (@ 3% oxygen)
Existing Boiler	Coal		3.0E-06	310 (@ 7% oxygen)
	Biomass			160 (@ 7% oxygen)
	Oil			2 (@ 3% oxygen)

CO CEMS Required for Boilers >100 Btu/hr Capacity

Natural Gas Boilers are Exempt Sources (Fuel Oil Used Only During Curtailment)

Are Process Heaters Regulated Under Area Source Boiler GACT?

Compliance Options

- **Options are Emission Limits, Emission Controls, Alternative Criteria, or a Combination**
- **Specific Options:**
  - Emission Limits (With or Without Controls) via Stack Testing
  - Fuel Analysis for HCl and/or Hg
  - Emission Averaging (Not Allowed for Area Sources)
  - Health Based Alternative No Longer Allowed

Fuel Analysis Example

- Applicable to Both Area and Major Sources
- Major and Area HAP sources have same 0.000003 lb Hg/MMBtu limit
- Fuel Sampling with 90th percentile result compared to allowable emission limit (not just average)
- Potential scenario where average sample results are well under limit, but 90th percentile result is over!

	Hg (lb/MMBtu)	% of Rule Limit
Individual sample Hg results range	.000001 to 0.000005	33% - 167%
Average Hg emission rate from all samples	0.0000014	46.67%
90th Percentile	0.0000031	103.33%
Rule Limit	0.000003	

- Bottom line is, fuel sample variability can greatly affect whether the HCl and/or Hg limit can be met on a ongoing basis by Fuel Analysis Option!

Control System Design Issues

- **Will Any Additional Emission Controls be Needed?**
- **For What Pollutants – PM, HCl, Hg, CO, etc.?**
  - Many Evaluation, Testing, Operating Limit, Permitting, SSM Plan, etc. Actions Will be Required if Emission Controls are to be Used
- **What Level of Emission Control is Needed/Appropriate?**
  - Consider Tradeoffs of Compliance Assurance, Fuel and Supply Variability, Coal Replacement Costs, Capital and Operating Costs, Co-Generation Needs, etc.
  - Retrofit of Existing Controls Versus New Controls
- **Detailed Near-Term Site Evaluation Needed to Compare Options and Select a Potential Strategy – Many Site-Specific Issues to Consider**
- **Schedule Needs to Account for Control Equipment Design, Fabrication, Construction, Testing, etc., if Applicable**

Another Requirement!!

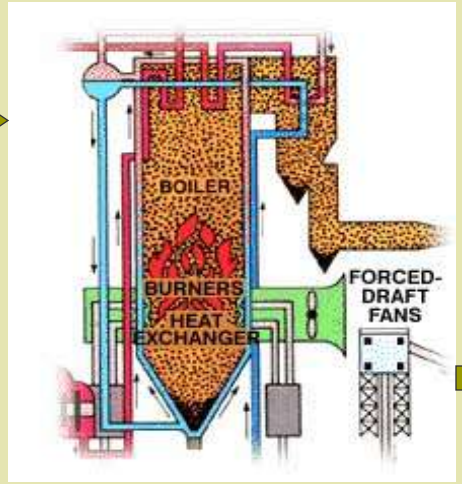
Energy Assessment

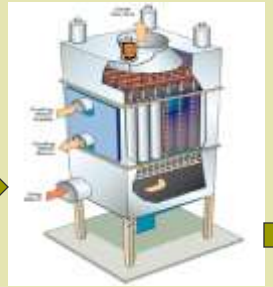
- Identify major energy consuming systems
- Review available architectural and engineering plans, facility operation and maintenance procedures and logs, as well s fuel usage
- Identify a list of major energy conservation measures
- Determine the energy savings potential of the energy conservation measures identified
- Prepare a comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments
- Develop a facility energy management program according to the ENERGY STAR guideline for energy management (Major Sources Only)
- Assessment conducted by qualified personnel

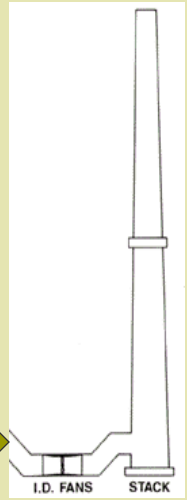
? Should Implementation of Findings be Required?

The Solution is a Process Issue.

Point of Compliance







Fuel Spec	Fan Modification	Retrofit	Permitting
Supply	Combustion Mod	Addition	Compliance Testing
Longevity	Operating Flexibility		Cost
Cost			

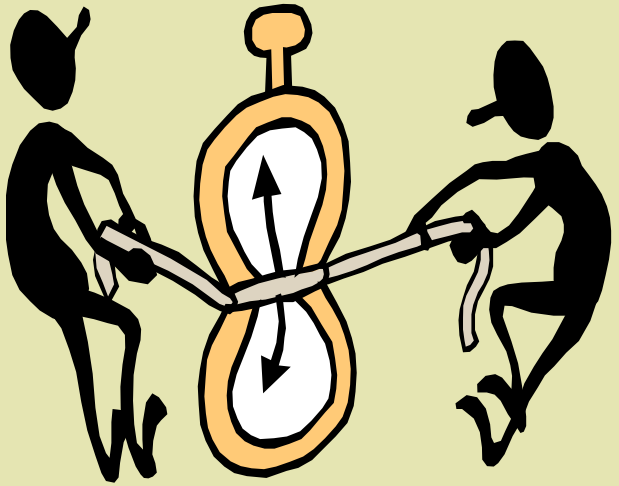
Each part of the process may be part of the answer!

Boiler NESHAP Planning Timeline

6/2010	1/2011	4/2011	8/2011	12/2011	6/2012	1/2013	6/2013	12/2013
Data Gathering and Initial Planning	Boiler Stack Testing Completed (as needed)	Engineering Evaluation and Fuel Supplier Review	Compliance Option Selection	Technology Selection and Design (as needed)	Permitting and Regulatory Negotiations	Fabrication, Construction, Check Out and Training	Testing, Monitoring, Reporting, etc	Ongoing NESHAP Compliance Activities

What's Next for Facilities?

- **Assess if you have boilers/process heaters subject to the rules**
- **Identify applicable emission limits and if you can comply with these limits at all times (even during start-up and shutdown)**
- **Evaluate if need additional emissions controls, perform economic analyses and plan for future budgets**
- **Determine if need additional monitoring systems**
- **Consider operational, process and/or fuel changes to reduce the regulatory burden**
- **If applicable, plan for a facility-wide energy assessment**



Public Comments to US EPA

- **Over 3,000 Commentors on Both NESHAPs**
- **Limits are Unachievable**
- **Will Significantly Adversely Impact Use of Biomass Renewable Energy**
- **MACT Floor Should be Determined on a Source Basis, not Pollutants by Pollutant**
- **Variability Not Adquately Addressed**
- **Averaging Periods Need to be Longer Due to SSM Events**
- **CO Surrogate and Compliance Not Appropriate/Feasible at Very Low CO Levels**
- **Very Low CO Levels Will Increase NOx Emissions**
- **Energy Assessment Not Appropriate, Excessive, Not Enforceable, etc.**

Questions?

References

- **Proposed Major and Area Source Boiler Rules**
- **http://www.epa.gov/ttn/atw/boiler/boilerpg.html**

- **Proposed Solid Waste Definition Rule**
- **http://www.epa.gov/epawaste/nonhaz/define/index.htm**

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