

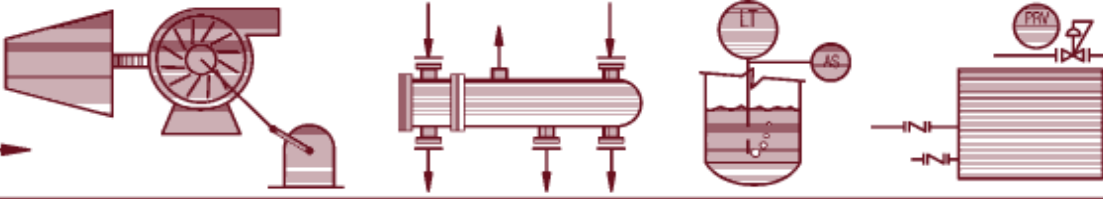
ENERGY SOURCE

A Newsletter published by

ESI

The Steam and Power *SPECIAL FORCES*®

Fall 2004



THE FEDERAL EPA FINALLY DELIVERS ON BOILER MACT PROMISE

By: William L. Reeves, P.E., ESI

Ever since MACT standards were initially proposed, industry has been waiting anxiously for the final promulgation of these standards so that a specific action plan for compliance can be determined. The Federal EPA finally promulgated “Boiler MACT” in the Federal Register on September 13, 2004. This final rule becomes effective November 12, 2004. Before we discuss what this means to those of you currently operating or anticipating the installation of an industrial boiler, we first want to define Boiler MACT.

The EPA was required by Congress as part of the Clean Air Act Amendments (CAAA) to establish National Emission Standards for Hazardous Air Pollutants (NESHAP). These standards are applicable to major sources of Hazardous Air Pollutants (HAP) for industrial, commercial, and institutional boilers and process heaters. Because the majority of the *ENERGY SOURCE* readership is primarily concerned with steam generation equipment, ESI calls it “Boiler MACT”.

What are the HAP being regulated? – Boilers and process heaters can emit a wide variety of HAP, depending upon the fuel being burned. Because of the large number of HAP potentially present in emissions and the disparity in the quantity and quality of the emissions information available, EPA developed the strategy to use surrogates to control multiple HAP in this final rule. EPA grouped the numerous potential HAP into four (4) categories: mercury, non-mercury metallic HAP, non-organic HAP, and organic HAP. EPA then identified compounds that could be classified as surrogates representing the entire category. The rationale is that if we can measure and control emissions of a single compound that represents the entire category, this should result in emission control of the entire group. The surrogate compounds whose emissions are regulated to control the four categories in Boiler MACT are as follows:

- Mercury (Hg)
- Particulate Matter (PM)
- Hydrogen Chloride (HCl)
- Carbon Monoxide (CO)

What is a major source? - Major sources of HAP are facilities that have the ability to emit more than 10 tons per year of a single HAP or 25 tons total of multiple HAP.

What does the term MACT mean? – The CAAA requires NESHAP to reflect the maximum degree of reduction in emissions of HAP that is achievable considering cost, non-air quality health and environmental impacts, and energy requirements. This level of control is considered the Maximum Achievable Control Technology, thus the term “MACT”.

ENERGY SOURCE

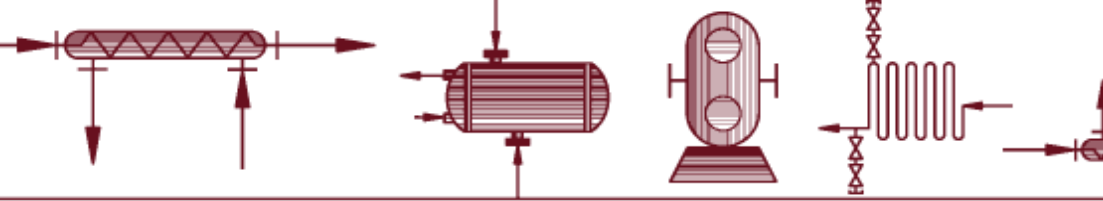
The *ENERGY SOURCE* is published quarterly for customers, employees, and friends of ESI Inc. of Tennessee.

ESI is the Steam and Power **SPECIAL FORCES®** providing clients with innovative, cost-effective, and environmentally-friendly solutions.

If you have any suggestions or comments about the newsletter feel free to call us at 770-427-6200 or e-mail us at energysource@esitenn.com.

Deanna White
Managing Editor

Continued on Page 2



BOILER MACT PROMISE... *Continued from Page 1*

Who does Boiler MACT affect? – If you are currently contemplating building or are currently starting up a new boiler facility of virtually any size and fuel, Boiler MACT will apply to you. If you own and operate a facility with boilers that burn a solid fuel with a heat input greater than 10 mmbtu/hr and the site is a major source for HAP, Boiler MACT will apply to you per Table I. If you have a new or reconstructed boiler installed or modified after January 13, 2003, or are in process of building or permitting a new unit, Table II will apply to you.

Electric utility steam generating units producing power for sale of 25 MW or greater are not affected. Waste heat boilers are excluded unless they have over 50% potential heat input capacity from duct firing or supplemental burners. Mobile temporary boilers in place for less than 180 days are also not regulated under this statute.

Table I. Existing Boilers - Emission Limits (lbs/MMBTU Heat Input)

Unit Size & Fuel (3)	Particulate Matter (PM)	Or (1)	Total Selected Metals (TSM)	Hydrogen Chloride (HCl)	Mercury (Hg)	Carbon Monoxide (2)
SF - LU	0.07	or	0.001	0.09	0.000009	---
SF - SU	---	---	---	---	---	---
SF - LMU	0.21	or	0.004	---	---	---
LF - Any Unit	---	---	---	---	---	---
GF - Any Unit	---	---	---	---	---	---

Table II. New Boilers - Emission Limits (lbs/MMBTU Heat Input)

Unit Size & Fuel (3)	Particulate Matter (PM)	Or (1)	Total Selected Metals (TSM)	Hydrogen Chloride (HCl)	Mercury (Hg)	Carbon Monoxide (2)
SF - LU	0.025	or	0.0003	0.02	0.000003	400 (7%)
SF - SU	0.025	or	0.0003	0.02	0.000003	---
SF - LMU	0.025	or	0.0003	0.02	0.000003	400 (7%)
LF - LU	0.03	---	---	0.0005	---	400 (3%)
LF - SU	0.03	---	---	0.0009	---	---
LF - LMU	0.03	---	---	0.0009	---	400 (3%)
GF - LU	---	---	---	---	---	400 (3%)
GF - SU	---	---	---	---	---	---
GF - LMU	---	---	---	---	---	400 (3%)

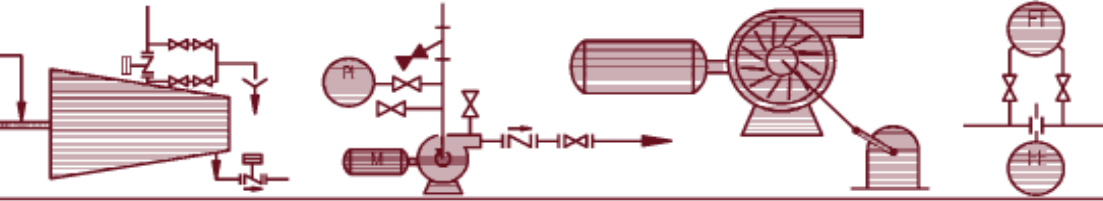
Note:

- (1) For Solid Fuel Boilers, compliance is a choice between a PM or TSM limit.
- (2) CO (ppm), O₂ (%)
- (3) Legend: SF= Solid Fuel LF= Liquid Fuel GF= Gaseous Fuel
 LU =Large Unit SU = Small Unit LMU = Limited Use

How does EPA classify size of sources? – EPA considers any source less than 10 mmbtu/hr as a small unit (SU) and over 10 mmbtu/hr as a large unit (LU). A limited use (LMU) unit is a large source with a capacity utilization less than or equal to 10 percent of its potential. In order to qualify for a limited use status, the capacity limitation must be part of a federally enforceable permit.

What are the continuous compliance requirements? – To demonstrate continuous compliance with the emission limitations, you must monitor and comply with the applicable site-specific operating limits established during the performance tests or fuel analysis.

Continued on Page 5



ESI Bulletin Board

RENTAL EQUIPMENT

Available For Rent!

- Boilers
- Deaerator Systems
- Boiler Feedwater Pumps
- Water Softener Systems

Check out our rental equipment on the web at www.rentalboilers.com.

OPERATOR TRAINING

Are Your Operators Properly Trained?

ESI offers a comprehensive Operator Training Program which could save your company a great deal of time, money, and could potentially mitigate losses from improper operation of the facility's powerhouse.

Our training program consists of three levels of training:

Basic Training - Training on powerhouse components including boilers, water treatment systems, steam and combustion turbines, burners, etc.

Advanced Training - Training customized for your particular powerhouse facility. ESI will visit your site, then develop a comprehensive training program for your facility.

Recurrent Training - Recurrent annual training for your operators, plus ESI will be on-call 24/7 to your operations staff to answer questions and troubleshoot problems.

All training programs occur on-site and include a training manual.



ATTENTION!

Do Your Project Needs Hit the Sweet Spot of Your Engineering Partner?

Everyone who has ever played golf knows that when the "sweet spot" of the club head impacts the ball, the feel, distance, and overall results of the shot are very different from an off center hit. Every organization has a "sweet spot"; the type of project that is well suited for that organization. Large A&E firms are absolutely necessary to perform the Engineering & Construction of a \$100,000,000 plus utility power station. However, ESI is better equipped to handle your smaller utility projects that range from \$10,000 to \$75,000,000. ESI's "sweet spot" includes: Environmental Compliance (NO_x and Hg Reduction) Projects, Material Handling Systems, Water Treatment Systems, Engineering & Feasibility Studies, etc.

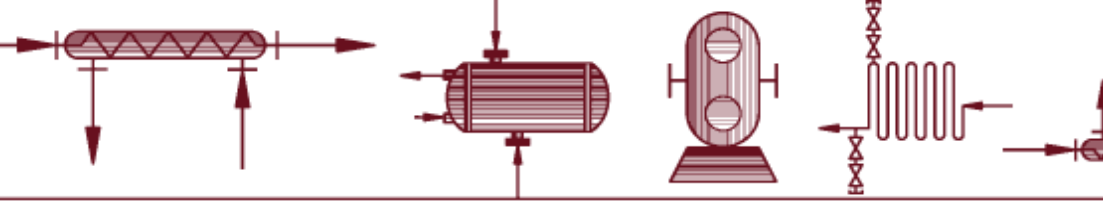
If you are not totally satisfied with your Engineering Partner contact Jay Garrett with ESI Today!

1-800-654-2512 or jgarrett@esitenn.com

**Contact ESI's STEAM & POWER SPECIAL FORCES®
Today at 770-427-6200 or info@esitenn.com.**



DILBERT reprinted by permission of the United Feature Syndicate, Inc.



COAL IS BACK... AND CANNOT BE IGNORED ANY LONGER

By: William L. Reeves, P.E., ESI

It's often said that "what goes around comes around" and "history repeats itself". When ESI began business in 1978, our main business was the conversion of industrial customers firing natural gas and oil over to bituminous coal. Throughout the period from 1978 to 1985, ESI designed and built numerous coal-fired boiler installations driven by the differential fuel cost between coal and gas/oil. Stoker coal was \$2.00 per mmbtu and gas was about \$5.00 per mmbtu and forecast to go higher. Sound familiar?

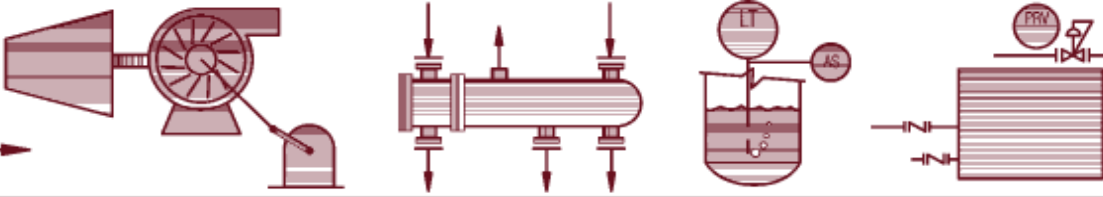
As gas and oil prices came down in the mid to late '80s and environmental regulations made coal firing more expensive, the new industrial coal-fired boiler business all but disappeared and has been missing in action until recently. Up until this year, gas prices have surged momentarily during difficult winter conditions; however, never before have they risen to the current levels and stayed there through the summer months. The long-term forecast for gas prices is not any brighter for the foreseeable future. The proliferation of combustion turbine power generation facilities, which have dramatically increased the natural gas demand, coupled with little to no new exploration and resulting increases in market capacity, has resulted in today's natural gas market dilemma. This situation is further complicated by the fact that fuel oil prices always have and always will be indexed to natural gas prices. What happened?

Like a frog immersed in a kettle of ambient temperature water slowly raised to a boil, industrial steam and power users and independent power producers have slowly been lulled into a state of euphoria spawned by natural gas economics, only to have the bubble recently burst. Natural gas became the fuel of preference due to the significantly lower capital requirements and much cleaner uncontrolled emissions compared to firing coal. The combined cycle economic proformas made sense as long as natural gas remained \$2.50-\$3.50 per mmbtu. At today's and the near term projected gas prices, many of the combined cycle cogeneration facilities recently commissioned cannot be operated profitably except for a few hours a year during periods of peak demand and high power prices.

Predominantly, the only solid fuel-fired power generation facilities that have been built in the last 15 years have been Circulating Fluidized Bed (CFB) technology installations predominantly firing waste fuels. ESI is currently performing the engineering, procurement, and construction management of a new 1.1 million pph CFB boiler for Corn Products International in the metropolitan Chicago area. This new boiler was originally conceived and designed to burn high sulfur Illinois coal; however, petroleum coke firing capability was added as a potential fuel during the permitting phase of the project. The CFB technology for large coal-fired boilers is well developed and the demand for these types of boilers is increasing dramatically as several large coal-fired CFB boilers have recently been purchased.

Many people are amazed that such a new, large coal-fired boiler can be built in such a high-density metropolitan area. Industry has become programmed to believe that coal-fired installations are simply too costly to build and near impossible to permit. There are numerous industrial facilities that use between 100,000 to 300,000 pph of steam that are currently satisfying their steam flow requirements by firing natural gas and oil. At the near to long term projected natural gas and coal prices, the concept of burning coal in these size facilities is now not just economically viable, but a very good investment. The fuel cost differential economic driving force, as seen in Figure 1, is now adequate

Continued on Page 5



BOILER MACT PROMISE... *Continued from Page 2*

What is my deadline for compliance? – If you have an existing boiler, you must comply by September 13, 2007. If you have a new or reconstructed boiler installed or modified after January 13, 2003, you must comply by November 12, 2004 or upon start-up, whichever is later. The compliance demonstration deadline date is an additional 180 days from the above mentioned compliance dates.

What do I do next? - Because of the limited capacity of the industry to provide equipment to meet these compliance requirements, the prudent company will aggressively develop and implement a plan to meet compliance and to avoid increased price and delivery issues as the compliance date draws near.

If you have any questions regarding how the Boiler MACT regulation applies to your facility, or if you require an analysis of the technology and cost requirements for your facility to meet compliance, please contact Bill Reeves at 770-427-6200 or breeves@esitenn.com. ESI would be happy to assist you in your assessment of the effect of Boiler MACT on your facility.

COAL IS BACK... *Continued from Page 4*

to build a state-of-the-technology coal-fired boiler that will meet all current and proposed environmental regulations and provide a very respectable return on investment. As you can see, coal prices have remained nearly constant over the last 10 years while natural gas prices have fluctuated wildly with an upward trend.

Since the coal-fired boiler business has been MIA for so long, the capacity of the market is but a fraction of what it once was, but that will change. The most proactive companies that recognize the opportunity that currently exists to attain energy cost independence from gas and oil markets will develop and maintain a competitive manufacturing cost structure that will serve them well in the future by converting their steam and power operations to coal as the fuel of choice. Look for the next issue of the *ENERGY SOURCE* where we will discuss the design and economics of a new coal-fired boiler system.

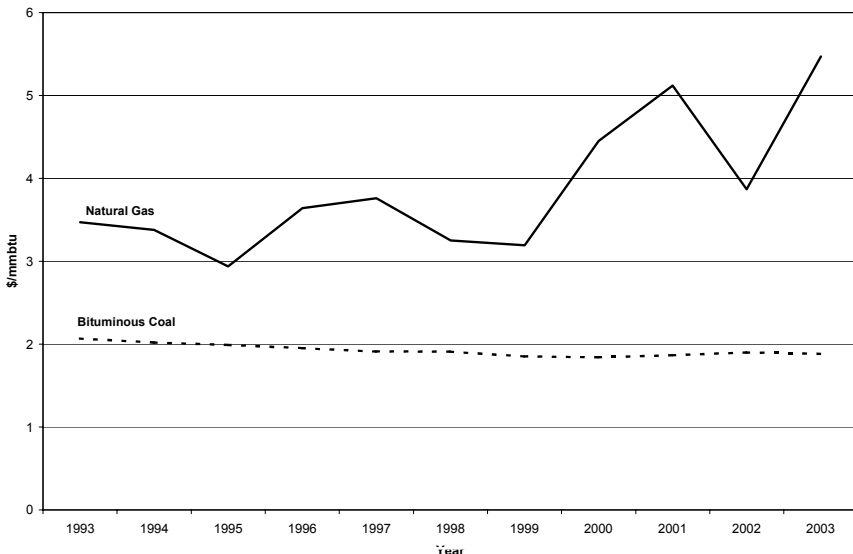


Figure 1. Natural Gas and Coal Prices

Note:

Source – Energy Information Administration/Annual Energy Review 2003

Coal Prices are based on Bituminous Coal. Freight has been included at \$20 per ton.

Natural Gas Prices are based on the Industrial Sector, including industrial combined-heat-and-power (CHP) and industrial electricity-only plants.

For related information, see www.doe.gov.