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# 2014 Missouri Air Compliance Seminar

## Boiler MACT Case Study

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# Boiler MACT Basics

## > Establishes Operating Limits

- ❖ Maximum fuel pollutant concentrations
- ❖ Operating loads
- ❖ Operating limits for control devices
- ❖ Some depend on compliance method chosen

**On to the Case Study...**

# Units Subject to Boiler MACT

Unit	Capacity (MMBtu/hr)	Fuel(s)
CFB	900+	Coal, Petroleum Coke, Natural Gas, Other fuels as allowed by permit
Natural Gas Boiler	150	Natural Gas
Package Boilers (3)	99	Natural Gas
Duct Burner	400	Natural Gas
Dew Point Heater	1.5	Natural Gas

# CFB Boiler Specifics

- > Rating: 900+ MMBtu/hr
- > Fuels: Natural Gas, Coal, Petroleum Coke, Other fuels as allowed by permit
- > Control Devices: Baghouse, Dry Scrubber with Limestone Injection, SNCR
- > Current CEMS: CO, SO<sub>2</sub>, NO<sub>x</sub>, CO<sub>2</sub>, Opacity

# Boiler MACT Input-based Emission Limits

Pollutant	Limit (lb/MMBtu)	Year X test (lb/MMBtu)	Year Y test (lb/MMBtu)
HCl	0.022	0.00006	0.0002
Hg	5.7 E-06	5.7 E-08	2.0 E-06
TSM	5.3 E-05	6.0 E-06	2.4 E-05
Filterable PM	0.04	0.004	0.005
CO	320 ppm*	N/A	N/A

\*For CEMS, by volume, dry basis, 3% oxygen, 30-day rolling average

# Options for Compliance

> Fuel Analysis

> Source Testing

> CEMS

- ❖ Can use SO<sub>2</sub> CEMS to show compliance with HCl limit if using dry sorbent injection

# Compliance Options - Fuel Analysis

- > Can be used if fuel pollutant concentrations are less than the emission limit (90<sup>th</sup> percentile confidence level)

Pollutant	Limit (lb/MMBtu)	Fuel Concentration (lb/MMBtu)*
HCl	0.022	0.054
Hg	5.7 E-06	5.4 E-06
TSM	5.3 E-05	5.52 E-03

\*Based on one fuel sample dated September 2009.

- > Monthly fuel analyses
- > If results for 12 months <75% of compliance level, move to quarterly fuel analyses.

# Source Testing (HCl, Hg, TSM)

- > Conducted annually
  - ❖ If <75% of limit for 2 years, test every 3<sup>rd</sup> year
- > Tests must be conducted burning mix of fuels that have highest content of Cl, Hg, and/or TSM
- > Maximum fuel pollutant levels established
- > Operating Load established (110%)

# Source Testing (cont'd)

- > Operating Limits for Control Devices
  - ❖ Maintain minimum sorbent injection rate
    - ◆ Different sorbents = different operating limits
  - ❖ If maintaining compliance via SO<sub>2</sub> CEMS, establish SO<sub>2</sub> limit as emission rate during most recent HCl source test

# A Word about PM/TSM Limits

- > Differences when choosing a Limit:
  - ❖ TSM - requires bag leak detection system and opacity limit of 10%
  - ❖ Filterable PM - Install, certify, maintain, and operate a PM CPMS or PM CEMS.
    - ◆ Use of CEMS eliminates requirement for fuel analysis, performance test, and operating limits

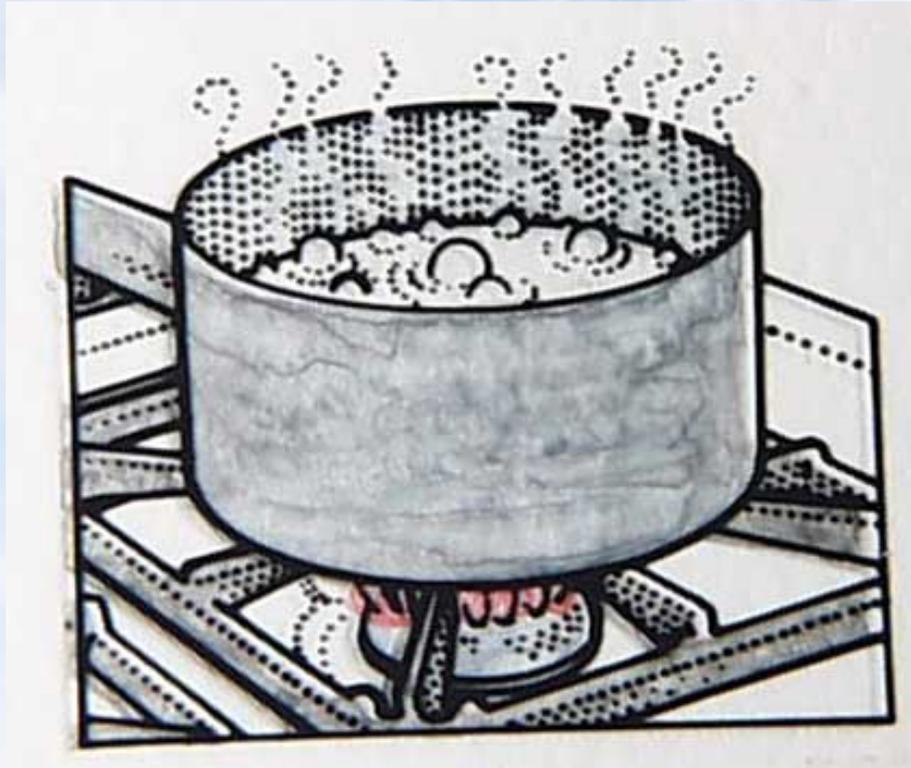
# Continuous Emission Monitoring Systems

- > CEMS must be installed, certified, operated, and maintained according to 40 CFR 60 or 40 CFR 75
- > Eliminates requirement for fuel analyses, performance testing, and operating limits

# Using SO<sub>2</sub> CEMS to comply with HCl limit

- > If using dry sorbent injection and have an SO<sub>2</sub> CEMS
- > Operating limit established using SO<sub>2</sub> emissions from most recent HCl performance test

# Can You Boil It Down?



# HCl Compliance Options

- > Fuel Analysis? No
- > Source Testing? Yes
  - ❖ Annual testing, possible every 3<sup>rd</sup> year
  - ❖ Operating load limit
  - ❖ Initial fuel analysis, maximum fuel pollutant levels established
  - ❖ Operating limit on dry sorbent established
- > CEMS? Yes
- > SO<sub>2</sub> CEMS? Yes
  - ❖ Establish SO<sub>2</sub> limit based on source test
  - ❖ Operate according to 40 CFR 75



# Summary of options

Pollutant	Fuel Analysis?	Source Testing?	CEMS?	Alternate?
HCl	NO	YES	YES	YES (SO <sub>2</sub> )
Hg	Marginal	YES	YES	NO
TSM	NO	YES	NO	YES (PM limit)
PM	NO	YES	YES	YES (TSM limit)

# Questions?

