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New Source Boiler MACT Compliance Case Study

Council of Industrial Boiler Owners
Technical Focus Group Mtg.
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Project Scope

- > Two Small Biomass Boilers at a Major HAP Source (< 50 MMBTU/hr)
- > Time Frame - Early 2011
- > Regulations in a state of flux
- > Controls
 - ❖ Baghouse
 - ❖ Sorbent injection

Permitting & Compliance Issues

- > NSR Issues
- > 112(d) or 112(j)
 - ❖ EPA issues final rule - March 21, 2011
 - ❖ EPA stay - May 16, 2011
 - ❖ Which rules are in place?
 - ❖ Draft December 2011 rule
 - ◆ New Provisions
 - ❖ DC District Court removes stay - January 9, 2012
 - ❖ Effective dates of rules?

Emission Limits

- > Moving Target
- > March 21, 2011 - January 30, 2013
 - ❖ Table 12 Limits:
 - ◆ PM: 0.008 lb/MMBtu heat input
 - ◆ HCL: 0.004 lb/MMBtu heat input
 - ◆ CO: 560 ppm by volume
 - ◆ Hg: 3.50 E-06 lb/MMBtu heat input
- > January 31, 2013
 - ❖ Table 1 Limits:
 - ◆ PM: 0.03 lb/MMBtu heat input
 - ◆ HCL: 0.022 lb/MMBtu heat input
 - ◆ CO: 620 ppm by volume
 - ◆ Hg: 8.0 E-07 lb/MMBtu heat input

Data Analysis for NESHAP Compliance

> Engineering Test Provided Clues

- ❖ With extremely tight limits in 2011, compliance was a concern
- ❖ Engineering testing provided preliminary data for compliance (with which limits??)
- ❖ Data for HCl control
- ❖ Data provided indication of required controls

Monitoring Options

- > PM - BLDS (5% alarms) or COMS (10% opacity)
- > CO
 - > O₂ CEMS (Per March 2011 final Rules)
 - > CO CEMS, or O₂ analyzer (oxygen trim system) (Per Dec. 2011 Proposed Rules)
 - > CO and O₂ CEMS, or O₂ analyzer (oxygen trim system) (Per Jan. 2013 Final Rules)
 - > CEMS Citing Issues
- > Boiler Load - logically steam
- > HCl & Hg - fuel sampling or performance testing

Initial Compliance

- > One Fuel
 - ❖ Performance Testing
- > Two or more fuels
 - ❖ Performance Testing and
 - ❖ Fuel Analysis
- > Compliance can be documented with either Performance Testing or Fuel Analysis for certain pollutants

Fuel Sampling

- > Two different fuels (biomass) proposed for boiler
- > Fuel sampling for wood - TSM, HCl, Hg
- > July 2012 - Results were not favorable - Met Hg not HCl (March 2011 rule) and met HCl and not TSM and Hg (Jan. 2013 rule).
- > February 2013 - Results were not favorable -met HCl and not Hg (Jan. 2013 rule). TSM unlikely
- > Due to the amount of effort required for fuel testing and the variability of results, fuel testing was undesirable
- > Annual source testing

Testing

> Emission Limit Compliance

❖ Annual Testing for

- ◆ PM, CO, HCl, & Hg
- ◆ If 2 consecutive years are less than 75% of EL, can reduce testing to once per three years
- ◆ If above 75%, must test annually (until previous requirement is met)

> Operating Limits Compliance

- ❖ Verify, or potential for, resetting Operating Limits each time the facility tests

Establish Operating Limits

- > Moving Target
- > March 21, 2011 - January 30, 2013
 - ❖ Minimum Oxygen Content - set at lowest hourly average from most recent performance test
 - ❖ Maximum Operating Load - set at 110% of the average operating load from most recent performance test
 - ❖ Operate a BLDS that alarms no more than 5% of the operating time during the 6 month period
- > January 31, 2013
 - ❖ Minimum Oxygen Content - set at lowest hourly average from most recent performance test
 - ❖ Maximum Operating Load - set at 110% of the highest hourly average operating load from most recent performance test
 - ❖ Operate a BLDS that alarms no more than 5% of the operating time during the 6 month period

Data Required to Analyze Compliance for Oxygen and Steam Load

- > 15 minute data collection for oxygen and steam load
 - ❖ Approx. 17,500 data points/operating parameter/boiler
 - ❖ Potentially 17,500++ data points since most analyzers collect data more often than 15 minutes
- > Missing 15 minute data = deviation
- > OLs were 12 hour block avgs., now 30 day rolling avgs.
 - ❖ Use and Average all available data
- > Differences between block & rolling avgs. - no real benefits ... except for missing data

Data Required to Analyze Compliance for BLDS

- > Setup BLDS per §63.7525(j)
- > Analyze data per §63.7540(a)(7)
 - ❖ Initiate corrective action within 1 hr of alert
 - ❖ Record date, time and duration of each alert
 - ❖ Record time each corrective action was initiated and completed along with cause and action taken
 - ❖ If inspection of FF indicates no need for corrective action, alert time is not counted
 - ❖ If corrective action is required, each alert is counted as 1 hr unless CA takes longer than 1 hr (then actual time)
 - ❖ Record % of operating time in each 6 month for alerts

Semiannual Reports - Overview

- > Contained within §63.7550 (a) - (e)
- > Massive reports
- > Large amounts of data to review (10 MB files not uncommon)
- > Deviations for missing data likely
- > Begin working on them at the beginning of the month they are due
- > Boiler fluctuations have negative affects on meeting operating limits

SAR - General Content

- > Company Administrative Information
- > Boiler (or PH) Description
- > ELs and OLs (could be more than one set of OLs)
- > Boiler operating time
- > Mass of each fuel burned in each boiler
- > Performance testing information on occurrence of testing (but most test data is submitted in NOCS)
- > Types of fuels burned, including new or future fuels
- > Fuel analysis information

SAR - General Content - 2

- > Deviations from EL and OL
- > Deviations from monitoring requirements (missing 15 minute data) and CMS (any CMS) out of control data
- > Malfunctions of affected source, APCD, or CMS
- > Tune-up information
- > Emission averaging
- > CEMS and CPMS data
- > RO certification statement

SAR - Deviation Reporting (not using a CMS)

- > Deviations from EL or OL
 - ❖ Not using a CMS for compliance
 - ❖ Example - source test results
 - ❖ Deviations Reporting
 - ◆ Description of deviation (such as failed test for X pollutant)
 - ◆ Number, duration, cause and corrective action
 - ◆ Explanation of a deviation during a performance test

SAR - Deviation Reporting (using a CMS)

- > Deviations from EL, OL, & Monitoring Req. (MR)
 - ❖ CMS - Generally applies to OL & MR
 - ❖ Deviations Reporting
 - ◆ Date, time, and description of deviation (such as exceed OL or missing 15 minute data)
 - ◆ Date and time CMS was inoperative (missing 15 minute periods)
 - ◆ Date and time CMS was out of control
 - ◆ Date and time each deviation started and stopped
 - ◆ Summary of total duration of the deviation during the reporting period and the total duration as a percent of the total source operating time during the reporting period

SAR - Deviation Reporting (using a CMS) - 2

❖ Deviations Reporting

- ◆ Characterization of total duration of deviations during the reporting period into those due to equipment problems, process problems, other known causes, and other unknown causes
- ◆ Summary of total CMS downtime during the reporting period and total duration of CMS downtime as a percentage of total source operating time during the reporting period
- ◆ Description of source from which there was a deviation
- ◆ Changes to any CMS, processes, or controls since the last reporting period for which there was a deviation

Other Reporting Requirements (see §63.7750(h))

- > The following reports/results must be submitted to EPA's WebFIRE database
 - ❖ Performance test results (within 60 days)
 - ❖ Fuel analyses (within 60 days)
 - ❖ Compliance reports (SAR) required by §63.7750(b)
- > CEMs data (within 60 days) to EPA's Central Data Exchange

Other Reporting Requirements - 2

(see §63.7750(h))

- > All reports required by Table 9 must be submitted electronically using CEDRI that is accessed through EPA's Central Data Exchange at the time the report is due; or
- > Must be sent to the EPA Administrator via mail if electronic submittal is not available

Lessons Learned

- > Understand how to operate the boilers to set OLs that you can meet
 - ❖ Dial the boiler in to get lowest O₂ value with maximum steam flow
 - ❖ Ensure boiler and controls are operating efficiently
- > Conduct engineering tests
- > QA/QC data collection systems
 - ❖ Understand shortcomings and constraints of your systems
 - ❖ Can you collect and average data?

Compliance Concerns

- > How are deviations going to be handled?
- > What is an acceptable level of OL deviations?
- > What is an acceptable level of missing data deviations?

Questions & Discussion



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