Boiler Rules Regulatory Update CIBO Quarterly Meeting

Amy Marshall, URS and John deRuyter, DuPont
December 3, 2014

Topics

- MATS Startup and Shutdown – final reconsideration
- Boiler MACT – EPA approach for evaluating use of UPL for small data sets
- Boiler MACT reconsideration
- Boiler GACT reconsideration
- CISWI reconsideration

MATS Startup and Shutdown

- Final rule 11/19/14
- Choose 1 of 2 startup definitions, notify which one, 3rd party PE evaluation if choose #2
- Max amount of clean fuel until end of startup if #2
- Engage PM controls within 1 hour of firing oil/coal if #2
- Additional MRR during SS, address in monitoring plan
- Additional clean fuels added
- Partial hour in S or S counts as 1 hour
- Common stack – comply with limits even if 1 unit in SS
- Keep using controls during shutdown as long as

MATS Startup Definition 1

- (1) Either the first-ever firing of fuel in a boiler for the purpose of producing electricity, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including onsite use). Any fraction of an hour in which startup occurs constitutes a full hour of startup; or

QnA – Bill Maxwell, EPA

- Startup ends when any of the steam from the boiler is used to generate electricity for sale over the grid or for any other purpose (including onsite use).
- Q-Does “any other purpose” modify “steam” or “electricity”?
- A- For a cogen unit, startup ends when either steam or electricity is produced for any purpose.

MATS Startup Definition 2

- (2) The period in which operation of an electric utility steam generating unit (EGU) is initiated for any purpose. Startup begins with either the firing of any fuel in an EGU for the purpose of producing electricity or useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes (other than the first-ever firing of fuel in a boiler following construction of the boiler) or for any other purpose after a shutdown event. Startup ends four hours after the EGU generates electricity that is sold or used for any other purpose (including on site use), or four hours after the EGU makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes, whichever is earlier. Any fraction of an hour in which startup occurs constitutes a full hour of startup.

Note

- There is no definition of **useful thermal energy** in MATS.
- EPA did propose a definition in the BMACT reconsideration:
  - *Useful thermal energy means energy (i.e., steam, hot water, or process heat) that meets the minimum operating temperature and/or pressure required by any energy use system that uses energy provided by the affected boiler or process heater.*

Work practice for startup definition 1

- Operate all CMS during startup, keep records, do reports
- Use clean fuels
- Once you convert to firing coal or residual oil, engage all of the applicable APCDs except dry scrubber and SCR. You must start your dry scrubber and SCR systems, if present, appropriately to comply with relevant standards applicable during normal operation.
- You must comply with all applicable emissions limits at all times except for periods that meet the applicable definitions of startup and shutdown in this subpart.

Work practice for startup definition 2

- Operate all CMS during startup. Collect appropriate data and calculate the pollutant emission rate for each hour of startup.
- Use one clean fuels to the maximum extent possible throughout the startup period. You must have sufficient clean fuel capacity to engage and operate your PM control device within one hour of adding coal, resid oil, or solid oil-derived fuel.
- You must comply with the applicable emission limits within 4 hours of start of electricity generation.
- Operate your particulate matter control(s) within 1 hour of first firing of coal, residual oil, or solid oil-derived fuel.
- You must start all other applicable control devices as expeditiously as possible, considering safety and manufacturer/supplier recommendations, but, in any case, when necessary to comply with other standards.

MATS Shutdown Definition

- The period in which cessation of operation of an EGU is initiated for any purpose. Shutdown begins when the EGU no longer generates electricity or makes useful thermal energy (such as heat or steam) for industrial, commercial, heating, or cooling purposes or when no coal, liquid oil, syngas, or solid oil-derived fuel is being fired in the EGU, whichever is earlier. Shutdown ends when the EGU no longer generates electricity or makes useful thermal energy (such as steam or heat) for industrial, commercial, heating, or cooling purposes, and no fuel is being fired in the EGU. Any fraction of an hour in which shutdown occurs constitutes a full hour of shutdown.

MATS Shutdown Work Practice

- Operate all CMS during shutdown. Collect appropriate data and calculate the pollutant emission rate for each hour of shutdown.
- While firing coal, residual oil, or solid oil-derived fuel during shutdown, you must vent emissions to the main stack(s) and operate all applicable control devices and continue to operate those control devices after the cessation of coal, residual oil, or solid oil-derived fuel being fed into the EGU and for as long as possible thereafter considering operational and safety concerns. Operate your controls when necessary to comply with other standards made applicable to the EGU by a permit limit or a rule other than this Subpart and that require operation of the control devices.
- If, in addition to the fuel used prior to initiation of shutdown, another fuel must be used to support the shutdown process, that additional fuel must be one or a combination of the clean fuels defined in § 63.10042 and must be used to the maximum extent possible.

MATS Startup and Shutdown

- Facilities must identify which definition of startup they plan to use. If the second startup definition and work practice are selected, a report must be prepared by an independent professional engineer licensed in the state in which the EGU is located that contains the information in 63.10030.
- The recordkeeping requirements during startup and shutdown are detailed in 63.10020 and the reporting requirements are detailed in 63.10031.

UPL for Small Data Sets

- EPA took remand of several “small data set” floors, memo for ferroalloys RTR addressed approach for evaluating UPL and floor calcs for subcategories with <9 data points
  1. Confirm correct distribution (normal vs lognormal) and correct UPL equation was used (all small data sets lognormal).
  2. For existing source floors with >1 unit, compare variance of selected best performer with other floor units. If top performer has high variance, may be better to use the next unit, especially if this indicates variable APCD performance.
  3. Determine the ratio of the 99UPL to the average – if >2.5, then may need to adjust confidence level or for new sources, pick another unit as top performer.

Limits that may be at risk

- New solid fuel HCl (99UPL/avg = 83). New HCl limit is equal to existing HCl currently because top performer has high variance (one high test and one low test on hog fuel) and 99 UPL >0.022. Limit could go to 2.9E-05 lb/MMBtu based on 2nd unit in floor (wood-fired). No control device being used.
- New liquid HCl (99UPL/avg = 3.22). This is the #2 unit because the #1 unit was burning a process liquid. There is no control device being used, so maybe a high variability is ok (based on fuel content variability). If #3 ranked unit is used because its variance is lower, the 99UPL is 2.13E-04 instead of 4.4E-04 lb/MMBtu.

BMACT Reconsideration Package

- Proposal signed and pre-publication version posted to TTN on 12/1/14.
  - http://www.epa.gov/ttn/atw/boiler/boilerpg.html
- Three issues for reconsideration
  - Startup and shutdown
  - CO limits at 130 ppm (no changes proposed, just asking for comment)
  - PM CPMS requirements and consequences of exceedances
- Various technical corrections
- Removal of affirmative defense
  - Preamble: case-by-case response looking at “the good faith efforts of the source to minimize emissions during malfunction periods, including preventative and corrective actions, as well as root cause analyses to ascertain and rectify excess emissions”

Miscellaneous Changes

- Clarification of exemptions, timing for EGU's, output based limits, fuel sampling requirements
- If you make a change or fuel switch that changes your subcategory you have 60 days to demonstrate compliance
- Added option for using CO2 as diluent for CEMS
- Deleted requirement to certify PM CPMS
- Corrected several dates and references
- Edits to NOCS and other reporting requirements
- Clarifications to electronic report submittal requirements
- Edits to several definitions
- Clarified operating load parameter is 30-day avg

Startup – Pick #1 or #2

- (1) Either the first-ever firing of fuel in a boiler or process heater for the purpose of supplying steam or heat for heating and/or producing electricity, or for any other purpose, or the firing of fuel in a boiler after a shutdown event for any purpose. Startup ends when any of the steam or heat from the boiler or process heater is supplied for heating, and/or producing electricity, or for any other purpose, or

Startup – Pick #1 or #2

- (2) The period in which operation of a boiler or process heater is initiated for any purpose. Startup begins with either the first-ever firing of fuel in a boiler or process heater for the purpose of supplying useful thermal energy (such as steam or heat) for heating, cooling or process purposes, or producing electricity, or the firing of fuel in a boiler or process heater for any purpose after a shutdown event. Startup ends four hours after when the boiler or process heater makes useful thermal energy (such as heat or steam) for heating, cooling, or process purposes, or generates electricity, whichever is earlier.

Useful Thermal Energy Definition

- Useful thermal energy means energy (i.e., steam, hot water, or process heat) that meets the minimum operating temperature and/or pressure required by any energy use system that uses energy provided by the affected boiler or process heater.

Startup Work Practices

- Addition of clean fuels:
  - For startup of a boiler or process heater, you must use one or a combination of the following clean fuels: natural gas, synthetic natural gas, propane, other Gas 1 fuels, distillate oil, syngas, ultra-low sulfur diesel, fuel oil-soaked rags, kerosene, hydrogen, paper, cardboard, refinery gas, liquefied petroleum gas, and any fuels meeting the appropriate HCl, mercury and TSM emission standards by fuel analysis.

Startup Work Practices – Pick #1 or #2

- (1) If you start firing coal/solid fossil fuel, biomass/bio-based solids, heavy liquid fuel, or gas 2 (other) gases, you must vent emissions to the main stack(s) and engage all of the applicable control devices except limestone injection in fluidized bed combustion (FBC) boilers, dry scrubber, fabric filter, selective non-catalytic reduction (SNCR), and selective catalytic reduction (SCR). You must start your limestone injection in FBC boilers, dry scrubber, fabric filter, SNCR, and SCR systems as expeditiously as possible. Startup ends when steam or heat is supplied for any purpose, OR

Startup Work Practices – Pick #1 or #2

- (2) If you choose to comply using definition (2) of "startup" in §63.7575, once you start firing (i.e., feeding) coal/solid fossil fuel, biomass/bio-based solids, heavy liquid fuel, or gas 2 (other) gases, you must vent emissions to the main stack(s) and engage all of the applicable control devices so as to comply with the emission limits within 4 hours of start of supplying useful thermal energy. You must effect PM control within one hour of first firing coal/solid fossil fuel, biomass/bio-based solids, heavy liquid fuel, or gas 2 (other) gases. You must start all applicable control devices as expeditiously as possible, but, in any case, when necessary to comply with other standards applicable to the source by a permit limit or a rule other than this subpart that require operation of the control devices.

#2, continued

- You must start all applicable control devices as expeditiously as possible, but, in any case, when necessary to comply with other standards applicable to the source by a permit limit or a rule other than this subpart that require operation of the control devices.
- The source may request a variance with the PM controls requirement. The source must provide evidence that (1) meeting the “fuel firing + 1 hour” requirement violates manufacturer’s recommended operation and/or safety requirements, and (2) the PM control device is appropriately designed and sized to meet the filterable PM emission limit.

Shutdown Definition

- Shutdown means the period in which cessation of operation of a boiler or process heater is initiated for any purpose. Shutdown begins when the boiler or process heater no longer makes useful thermal energy (such as heat or steam) for heating, cooling, or process purposes and/or generates electricity or when no fuel is being fed to the boiler or process heater, whichever is earlier. Shutdown ends when the boiler or process heater no longer makes useful thermal energy (such as steam or heat) for heating, cooling, or process purposes and/or generates electricity, and no fuel is being combusted in the boiler or process heater.

Shutdown Work Practices - Change

- While firing coal/solid fossil fuel, biomass/bio-based solids, heavy liquid fuel, or gas 2 (other) gases during shutdown, you must vent emissions to the main stack(s) and operate all applicable control devices, except limestone injection in FBC boilers, dry scrubber, fabric filter, SNCR, and SCR but, in any case, when necessary to comply with other standards applicable to the source that require operation of the control device.

Shutdown Work Practices - New

- If, in addition to the fuel used prior to initiation of shutdown, another fuel must be used to support the shutdown process, that additional fuel must be one or a combination of the following clean fuels: Natural gas, synthetic natural gas, propane, other Gas 1 fuels, distillate oil, syngas, ultralow sulfur diesel, refinery gas, and liquefied petroleum gas.

New – Startup and Shutdown Plan

- If you have an applicable emission limit, you must develop and implement a written startup and shutdown plan (SSP) according to the requirements in Table 3. The SSP must be maintained onsite and available upon request for public inspection.

SS Recordkeeping for Units with Limits (not required for Gas 1)

- Calendar date, time, occurrence and duration of each SS
- Type(s) and amount(s) of fuels used during each SS
- Startup - time when firing (i.e., feeding) start for coal/solid fossil fuel, biomass/bio-based solids, heavy liquid fuel, or gas 2 (other) gases; the time when useful thermal energy is first supplied; and the time when the PM controls are engaged.
- Startup - hourly steam temperature, hourly steam pressure, flue gas temperature, and all hourly average CMS data (e.g., CEMS, PM CPMS, COMS, ESP total secondary electric power input, scrubber pressure drop, scrubber liquid flow rate) collected during each startup period to confirm that the control devices are engaged.

Addition to Definition of Load Fraction

- Load fraction means the actual heat input of a boiler or process heater divided by heat input during the performance test that established the minimum sorbent injection rate or minimum activated carbon injection rate, expressed as a fraction (e.g., for 50 percent load the load fraction is 0.5). For boilers and process heaters that co-fire natural gas or refinery gas with a solid or liquid fuel, the load fraction is determined by the actual heat input of the solid or liquid fuel divided by heat input of the solid or liquid fuel fired during the performance test (e.g., if the performance test was conducted at 100 percent solid fuel firing, for 100 percent load firing 50 percent solid fuel and 50 percent natural gas the load fraction is 0.5).

Area Source Rule Proposed Reconsideration

- Technical corrections/clarifications
- Delete affirmative defense
- Added/edited some definitions
- Energy Star exemption from energy assessment
- Changes to startup and shutdown definitions, add useful thermal energy definition
- No change to startup/shutdown work practice
- Request comment on various reconsideration issues

Area Source Startup Definition Option 2

- (2) The period in which operation of a boiler is initiated for any purpose. Startup begins with either the first-ever firing of fuel in a boiler for the purpose of supplying useful thermal energy (such as steam or hot water) for heating, cooling or process purposes, or producing electricity, or the firing of fuel in a boiler for any purpose after a shutdown event. Startup ends four hours after when the boiler makes useful thermal energy (such as steam or hot water) for heating, cooling, or process purposes, or generates electricity, whichever is earlier.

CISWI Proposed Reconsideration

- CEMS data during startup and shutdown periods - Taking comment on whether definition should be revised to extend startup period to include transition to waste combustion from startup fuel
- PM limit for waste-burning kilns - Soliciting comment on dataset used in Feb. 2013 rule
- Requesting comments and data to support establishing FVF for Coal ERUs
- Definition of kiln - Proposing to include in-line raw mill and in-line coal mill as part of kiln and thus subject to emission limits. Allow for flow-weighted average kiln stack concentration.
- Several technical corrections
- Clarification that incinerators and air curtain incinerators will remain as new sources under 2000 NSPS until regulated as existing sources under state or federal plan that implements 2013 rule
- Affirmative defense struck

Questions and Discussion