Boiler MACT Startup and Shutdown Issues

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Agenda

- Why do we have to have requirements that apply during SSM?
- Evolution of Boiler MACT startup and shutdown requirements
- Startup and shutdown requirements under current final boiler rules
- Issues/concerns with meeting these requirements

Why do we have requirements for SSM?

- Sierra Club v EPA case in 2008 resulted in vacatur of 2 provisions [40 CFR 63.6(f)(1) and (h)(1)] that exempted sources from meeting MACT requirements during SSM.
- There has to be some requirement at all times, either a numeric standard or a work practice.

When can EPA have work practice requirements?

- Clean Air Act 112(h) allows EPA, in cases where it is not feasible to prescribe or enforce an emission standard [under Section 112(d) or (f)], to promulgate a design, equipment, work practice, or operational standard.
- Not feasible means you can't design something to capture/control the emissions or it is technologically or economically infeasible to measure the emissions.

Evolution of BMACT Startup and Shutdown Requirements

- 2004 rule – Facilities do not have to meet MACT requirements during periods of SSM (vacated).
- 2010 proposal – Emission limits apply at all times, including startup, shutdown, and malfunction.
- 2011 final rule – work practice to minimize time in SS, follow manufacturer's procedures. No definition of startup and shutdown in the rule.

2011 Reconsideration

- Startup and shutdown definitions based on 25% load (startup ended when unit reached 25% load; ok for liquid/gas, probably not for solid fuel units).
- Work practices include maintain good combustion conditions, optimize O2 concentrations, train operators, maintain records.

2012 MATS Rule

- 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).
- For startup of a unit, you must use clean fuels, either natural gas or distillate oil or a combination of clean fuels for ignition. Once you convert to firing coal, residual oil, or solid oil-derived fuel, you must engage all of the applicable control technologies except dry scrubber and SCR.
- EPA reconsidering MATS startup/shutdown.

2013 Final Rule Work Practice

Part 1 – Clean Fuels

You must use one or a combination of the following clean fuels: natural gas, synthetic natural gas, propane, distillate oil, syngas, ultra-low sulfur diesel, fuel oil soaked rags, kerosene, hydrogen, paper, cardboard, refinery gas, and liquefied petroleum gas.

BMACT Startup Work Practice

Part 2 – Start your controls

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.

EPA Justification

"The EPA carefully considered fuels and potential operational constraints of APCD when designing its work practices for periods of startup and shutdown. The EPA notes that there is no technical barrier to burning clean fuels (e.g., natural gas, distillate oil) for longer portions of startup or shutdown periods at a boiler and the HAP emission reduction benefits warrant additional utilization of such fuels until the temperature and stack emissions pressure is sufficient to engage the APCD."

BMACT Startup Definition

- Startup means 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 or process heater 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.

BMACT Shutdown Definition

- Shutdown means the cessation of operation of a boiler or process heater for any purpose. Shutdown begins either when none of the steam and heat from the boiler or process heater is supplied for heating and/or producing electricity, or for any other purpose, or at the point of no fuel being fired in the boiler or process heater, whichever is earlier. Shutdown ends when there is both no steam or heat being supplied and no fuel being fired in the boiler or process heater."

Monitoring/Recordkeeping

- You must keep records concerning the date, time, duration, and type and amount of fuel usage during startup and shutdown.
- You must operate all CMS during startup and shutdown (even though emissions and operating limits do not apply).

GACT Startup/Shutdown

- Same definition of startup/shutdown but less prescriptive work practice.
- Minimize the boiler's startup and shutdown periods and conduct startups and shutdowns according to the manufacturer's recommended procedures. If manufacturer's recommended procedures are not available, you must follow recommended procedures for a unit of similar design for which manufacturer's recommended procedures are available.

Issues/Concerns

- Need a better startup definition. Some units supply steam as soon as they start firing fuel, so this is not the end of startup. Other units may be forced to vent steam under this definition until they complete startup.
- ESPs cannot be engaged until the proper temperature and O2 levels are met. You don't want to engage your ESP when you startup on heavy oil. Many units will need to install clean fuel capability if ESPs must be started up prior to firing solid fuel or heavy liquid.

Issues/Concerns (cont.)

- Safety and protecting the equipment from damage are the primary operational concerns during startup and shutdown. Equipment needs to reach operational effectiveness before startup ends. Facilities have economic incentive to minimize time in S/S already.
- Needs to be unit specific (incorporate into permit) or at least boiler design specific.
- Include all Gas 1 in Clean Fuel definition.
- What happens in a common stack situation?

Summary

- Startup/shutdown definitions and work practices in BMACT are very prescriptive, and as written, will require operational changes.
- Industry will likely request reconsideration on this issue since the definitions and work practices changed significantly with the 2013 final rule.
- Need to watch what's happening on MATS.

Questions?

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