Boiler MACT & Related Rules

Western Regional Boiler Association
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ENVIRON
Clean Air Act Rules Recently Finalized

- National Emissions Standard for Hazardous Air Pollutants (NESHAP)
  - Major Source Industrial, Commercial & Institutional (ICI) Boilers and Process Heaters
    - 40 CFR Part 63 Subpart DDDDD
  - Area Source ICI Boilers
    - 40 CFR Part 63 Subpart JJJJJJ
- Originally issued on March 21, 2011
- Reconsidered and Finalized on:
  - Jan. 31 (Major Source)
  - Feb. 1 (Area Source)
Clean Air Act Rules Recently Finalized

- **New Source Performance Standard (NSPS)**
  - Commercial & Industrial Solid Waste Incinerators (CISWI)
    - 40 CFR Part 60 Subparts CCCC & DDDD
- **Non-Hazardous Secondary Materials (NHSM) Rule**
  - 40 CFR Part 241
- Originally issued on March 21, 2011
- Reconsidered and Finalized on Feb. 7
NESHAPs

• **Definitions**
  - **Major Source:** $\geq 10$ tpy single HAP, or $\geq 25$ tpy combination of HAPs
  - **Area Source:** not a major source

• **Maximum Achievable Control Technology (MACT)**
  - Applies to major sources
  - Minimum stringency criteria (MACT Floor)

• **Generally Available Control Technology (GACT)**
  - May apply to area sources
  - EPA can specify management practices instead
Major Source Boiler MACT Applicability

- Stationary Boiler or Process Heater, Located at a Major Source
- Any Industrial, Commercial, or Institutional Facility
- In many cases, process emissions exceed HAP threshold, not boiler/process heater
  - Lumber manufacturing facilities (kilns)
  - Plywood manufacturing facilities (dryers and presses)
Exceptions

• Any unit covered by another NESHAP Rule
  – Electric utility steam generator, Recovery boiler, R&D, Refining kettle, Ethylene cracking furnace, Blast furnace stoves, etc.
• Hot water heaters
• Used as a control device to meet another standard
• Temporary units
• Blast furnace gas fuel-fired
• Hazardous waste combustors
• Residential boilers
Fuel Categories

- Gaseous fuels (natural gas, refinery gas, process gas, etc.)
- Liquid fuels (distillate oil, residual oil, residuals, etc.)
- Solid fuels (coals, biomass, solid waste, etc.)
New and Existing Units

• New
  – Commenced construction after June 4, 2010
  – Four groups within “new”
    • After June 4, 2010 & before May 20, 2011
    • After May 20, 2011 & before December 23, 2011
    • After December 23, 2011 & before January 31, 2013
    • After January 31, 2013

• Existing
  – Not new
Major Source Boiler Compliance Dates

- New units – by Jan. 31, 2013 or upon startup
- Existing units – no later than Jan. 31, 2016
• 18 boiler or process heater subcategories
• Solid, liquid, and “Gas 2” fuels have limits on:
  – Hydrogen Chloride
  – Mercury
  – Filterable PM or Total Selected Metals (TSM)
    • Surrogates for metal HAPs
  – CO
    • Surrogate for VOC HAPs
• No limits for “Gas 1” units
• PM or TSM, HCl, Hg
  – lb/MMBtu heat input, or
  – lb/MMBtu steam output or lb/MWh electrical generation
    • Intended to provide energy efficiency benefit
• CO
  – ppmvd @ 3% O₂
  – Limits depend on continuous compliance method
    • Operating limits or CEMS
• Different limits for new (all four types) and existing
• Limits apply at all time, except startup and shutdown
Work Practice Standards

• Tune-up
  – Every 5 years:
    • Units with continuous oxygen trim system
    • Gas 1, Gas 2, and Light Liquid units ≤ 5 MMBtu/hr
    • Limited use units
  – Every 2 years:
    • Heavy Liquid and Solid units < 10 MMBtu/hr w/o O₂ trim
    • Gas 1, Gas 2, and Light Liquid units > 5 MMBtu/hr and < 10 MMBtu/hour
  – Annually: All other units
• One-time energy assessment: All existing units
• Startup and shutdown requirements
  – Clean fuels during startup
  – Control devices and CEMS, if present, must be operable
    • Exceptions provided
• Existing units (began before June 4, 2010)
  – Performance test or fuel analysis (for Hg, HCl, TSM)
    • No later than 180 days after compliance date
  – Establish operating limits during performance tests
  – Initial tune-up and one-time energy assessment
    • Complete by compliance date

• New units
  – Performance test or fuel test (for Hg, HCl, TSM) no later than:
    • July 30, 2013 (July 29, 2016 if subject to higher limit), or
    • 180 days after startup
  – Establish operating limits during performance tests
  – Initial tune up
Continuous Compliance

- Performance tests and operating limits
  or
- Fuel testing (for HCl, Hg, or TSM only) and operating limits
  or
- Continuous monitors for CO, PM, HCl, Hg

- Optional alternatives:
  - Emissions averaging
  - Efficiency credits (for output-based limits)
Operating Limits

• Apply to units with no CEMS
• PM control:
  – Wet scrubber – liquid flow rate
  – Fabric filter – opacity and leak detection system
  – ESP – opacity and electric power inputs
  – Other – opacity
• CO – Oxygen analyzer
• HCl control:
  – Wet acid gas scrubber – effluent pH
  – SO₂ CEMS
• Hg – Dry scrubber or carbon injection rate
• Performance test – maintain within 110% of max test load
• Fuel analysis – maintain fuel type/mix
Initial Notifications and Reporting

- **Initial Applicability Notification**
  - By May 31, 2013 if constructed before Jan. 31, 2013
  - Within 15 days of startup if constructed after Jan. 31, 2013

- **Initial Notification of Compliance Status**
  - 60 days following completion of all test/demonstrations

- **Compliance reports submitted semiannually**
  - January 1 – June 30 by July 31
  - July 1 – December 31 by January 31

- **Intent to conduct performance test**
  - Submit at least 30 days prior to test
• Keep copies of:
  – Submitted notifications and reports
  – All supporting documentation
  – Records of monitoring data, operating limit averages
  – Monthly fuel use and types
  – Fuel analysis calculations (if applicable)
  – Malfunction documentation (actions taken)
  – Startups & shutdowns (time, date, duration, fuel used)

• Keep for:
  – Five years following applicable date
  – First two years must be onsite (or accessible onsite)
  – Remaining three years can be offsite
Area Source Rule Applicability

- Industrial, commercial, or institutional boiler located at, or part of, an area source of HAPs
  - Check entire facility HAP emissions, not just boiler
  - No process heaters
- If trying to become area source to avoid major source rule, must be established as an area source before the first substantial compliance date
- May need to develop a non-applicability determination, and keep records of exemption
Area Source Rule Exemptions

- Boilers subject to another NESHAP
- Boilers that fire hazardous waste
- R&D boilers
- Gas-fired boilers (not just natural gas, any gas)
  - Liquid fuel for 48 hr/yr testing, and during curtailment
- Hot water heaters
- Boilers used as a control device
- Temporary boilers
- Residential boilers
- Electric boilers
- Electric utility steam generators
Area Source Rule Requirements

- Numerical emission limits for:
  - Coal, biomass, and oil units > 10 MMBtu/hr
    - Excluding limited use & seasonal boilers
  - Mercury and CO (coal only) for new and existing units
  - PM (filterable) for new units only
- Tune-ups required for some units < 10 MMBtu/hr
- Units > 10 MMBtu/hr:
  - One-time energy assessment
  - Startup/shutdown work practices standards
Earlier than for major sources
Existing boilers – March 21, 2014
New boilers:
  – May 21, 2011 if startup was before that date
  – Upon startup if startup is after May 21, 2011
Unlike Major Source Rule, Area Source Rule not stayed, so initial notification was due in Sep. 2011
Initial tune up & initial compliance for existing units was delayed by “no action” letters until final rule was finalized
Tune-ups for Area Source Boilers

• Initial, then biennial:
  – Existing coal units < 10 MMBtu/hr, oil units > 5 MMBtu/hr, biomass units

• Biennial:
  – New coal units < 10 MMBtu/hr, oil units > 5 MMBtu/hr, biomass units

• Initial, then every 5 years:
  – Existing coal/biomass/oil unit with oxygen trim, oil unit < 5 MMBtu/hr, limited use, seasonal

• Every 5 years:
  – New coal/biomass/oil unit with oxygen trim, oil unit < 5 MMBtu/hr, limited use, seasonal
• Initial Notification (by Jan. 20, 2014)
• Notification of Initial Compliance
  – 120 days after compliance date
• Records establishing exemptions/applicability
  – Source status (area vs. major), boiler capacity, etc.
• On-going Monitoring/Recordkeeping
  – Records of fuel type and usage
  – Mercury: Fuel analysis or stack testing
  – PM: Stack test
  – CO: Stack test and O₂ CEMS
  – Operating parameter limits for control equipment
Energy Assessments - Overview

• New requirement never seen in other rules before
• Focused on steam and process heating systems
• Purpose is to “identify cost-effective energy conservation measures”
• “Cost effective” means payback < 2 years
• Must conduct the assessment, but no requirement to implement findings
• Compliance dates
  – Jan. 31, 2016 for major sources
  – Mar. 21, 2014 for area sources
Energy Assessment Requirements

• Visual inspection
• Operating characteristics and specifications
• Inventory major energy use systems
• Review plans, O&M procedures, and fuel usage
• Report includes:
  – Ways to improve efficiency
  – Time frame to recoup investments in improvements
• How long do I have to comply?
• Do I have to assess only boiler, or other systems as well?
  – Only boiler and downstream energy use systems
• Can I complete this using internal resources?
  – Yes, as long as assessors are qualified (see rule)
• How long will the assessment process take?
  – Depends on size/scope, likely 2 to 6 weeks
• What are some guidelines on costs?
  – Depends on complexity/size, ~$5k to $50k+
• Are steam/hot water end users included?
  – Entire system including central plant, distribution, end users
Section 129 of Clean Air Act required EPA to establish Standards for Solid Waste Incineration Units
- Solid Waste Incineration Unit defined as “a distinct operating unit of any facility which combusts any solid waste material from commercial or industrial establishments or the general public”

Covers sources of all sizes; function of solid waste combustion unit determines applicability
Final CISWI Rule

• NSPS for new sources (Subpart CCCC)
  – Federal rule applicable to the source
• Emissions Guidelines for existing sources (Subpart DDDDD)
  – Rule applicable to the regulatory agency
  – Source applicable rule must be developed by states
• A CISWI unit is any combustion unit at a commercial or industrial facility used to combust solid waste
• Non-Hazardous Secondary Materials that are non-waste fuels may be combusted in boilers or process heaters that are not subject to the CISWI Rule
• Used to identify which NHSM are, or are not, solid wastes
• Demonstrate compliance by Feb. 7, 2016
• Two groups of NHSM:
  – Material transferred to a third party, not discarded, indistinguishable from a fuel product
  – Material discarded, but “transformed” by being “processed,” and meeting “legitimacy criteria”
• Regulatory path for “non-discarded” NHSM
• Sources may “self-certify” for “transformed” NHSM
Processing NHSM

• Includes, but not limited to:
  – Removing or destroying contaminants present in the material,
  – Significantly improving the fuel characteristics of the material (e.g., sizing or drying the material),
  – Chemically improving the as-fired energy content of the material, or
  – Improving the ingredient characteristics.

• Not sizing alone
• Managed as a valuable commodity:
  – Reasonable storage time prior to use
  – Managed consistent with any analogous fuel, or
  – Contained to prevent release
• Have meaningful heating value and be used in energy recovery unit
• Contaminants at levels comparable to traditional fuels unit is “designed to burn”
Questions??

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