Federal Regulations Affecting Boilers and Process Heaters

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Technical Assistance Services Include:

- Air
- Water
- RETAP
- Waste
- Site Remediation
- Permit Coordination
- Environmental Leaders
Today’s Goals

New Boiler Regulations

• Background
• Who’s Subject
• Key Compliance Dates
• How Determine Requirements
• New DEQ Compliance Tools
Today’s Session

• High Level Overview

• Boiler standards are federal standards

• DEQ will roll boiler requirements into NSR/ROP permits
Today’s Session

• Outline

• Resources
  – EPA Compliance Guides
  – DEQ Applicability Flowchart

• Index Cards – DEQ FAQ
Background
National Emission Standards for Hazardous Air Pollutants (NESHAP)

Federal rules regulating toxic emissions of hazardous air pollutants (HAPs)
NESHAP Background

- **Industrial** at manufacturing, service, mining, and refining facilities

- **Commercial/institutional** at hotels, medical/research centers, municipal offices, schools, restaurants, laboratories, and laundries
Federal Rules Promulgation

- Were promulgated with a “suite” of sister rules (CISWI & NHSM)
- Initially issued March 21, 2011
Federal Rules Promulgation

Found under:

**5D - 40 CFR 63, NESHAP, Subpart DDDDDD Major HAP sources**

**6J - 40 CFR 63, NESHAP, Subpart JJJJJJJJJ (6J) Area HAP sources**
Federal Rules Promulgation

• Final issued 1/31/13 (5D) and 2/1/13 (6J)

• EPA voluntary motion of remand without vacatur on emission limits 2/28/14
Federal /State Overview

• ~1.3 M boilers nationally…
  • 5D impact 14,000
  • 6J Impacts 183,000

• DEQ/EPA received < 100 notices

• MAERS has ~ 1000 units at > 400 facilities
Boiler NESHAP Goals

• Minimize emissions from 200,000 units at 90,000 sources
• Improve public health
• Preserve air quality
• Reduce emissions common to combustion HAPs like mercury
Who Is Subject?
5D & 6J Affected Source

5D Major HAP Sources
- Boilers
- Process heaters

6J Area HAP Sources
- Boilers
Major HAP Source

- Has PTE > 25 TPY multiple HAPs or
- Has the PTE > 10 TPY single HAP
  (e.g. chemical manufacture, petroleum refinery, pharmaceutical manufacturer)
NESHAP Definitions

Area HAP Sources

- Any non-major HAP sources

- All sources with boilers need to review applicability and maintain records to verify any exemption

- (e.g. hospitals, municipalities, universities, small businesses)
Boiler

- Enclosed device with controlled flame combustion
- Primary purpose of recovering heat energy in the form of steam or hot water
5D & 6J Definitions

Process Heater

- Enclosed device with a controlled flame
- Primary purpose of indirectly transferring heat instead of generating steam, combustion gas does not contact process material (e.g. glycol heater)
5D & 6J NESHAP Definitions

Tip!

• Be sure to review NESHAP definitions (affected source, fuel type, subcategory, etc.) when reviewing applicability.

• Definitions differ between and within standards and are integral to identifying the correct requirements.
Exemptions
5D & 6J Affected Source Common Exemptions

Boilers

• Residential boilers

• Temporary boilers - gas or liquid fuel

• Hazardous waste and solid waste incinerators;

• Boilers subject to another NESHAP (e.g. EGU)
**5D & 6J Affected Source Common Exemptions**

**Boilers**

- Control devices - > 50% gas coming from a controlled stream
- Waste heat boiler
- R & D or test boilers
- Blast furnace boilers/stoves receiving > 90% gas from blast furnace
5D & 6J Affected Source
Common Exemptions

Process Heaters

• Hot water heaters

• Autoclaves
Boilers

• Gas boilers
  – Natural, process, landfill, coal-derived, refinery, hydrogen and/or bio gas(es)
  – Do NOT burn solid fuel
  – Fire liquid during gas curtailment or supply interruption
  – Otherwise, fire liquid for testing and O & M $\leq 48$ hours/year
5D/6J Exemption Records

Keep records documenting your exemption finding readily available for inspection, including those detailing:

- equipment design and fuel capabilities
- energy use system
- fuel use (type, amount, and hours)
- permit restrictions, etc.
Key Dates
5D/6J Affected Source
Key Dates

Initial Notice of Applicability

– Past Due for both!

– 5D Existing: 5/31/13

– 6J Existing: 1/20/14
5D/6J Affected Source

Key Dates

Initial Compliance Date

Past Due for 6J!

- 5D Existing: 1/31/16
- 6J Existing: 3/21/14
5D/6J Affected Source Key Dates

Initial Notification of Compliance Status

- 5D Existing no EL: \( \leq 60 \) days of compliance verific & \( < 4/1/16 \)

- 5D Existing EL: \( \leq 60 \) days of compliance verific & \( < 9/27/16 \)
5D/6J Affected Source

Key Dates

Initial Notification of Compliance Status

- 6J Existing no EL: 7/19/14
- 6J Existing EL: 60 days of compliance verif & < 9/17/14
6J/5D NESHAP Requirements
5D/6J Key Requirements

Primary Requirements

- Emission limits
- One-time energy assessment
- Periodic tune-ups
# HAP Target Pollutants

<table>
<thead>
<tr>
<th>5D MAJOR</th>
<th>6J AREA</th>
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<tbody>
<tr>
<td>• HCl/SO2</td>
<td>• PM</td>
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<tr>
<td>• TSM/PM</td>
<td>• CO</td>
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<tr>
<td>• CO</td>
<td>• Hg</td>
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HCl/SO2 – acid gas surrogate  
TSM/PM – metal HAP surrogate  
CO – dioxin/furan/organic HAP surrogate
Nationally Projected Statistics

Major 5D – MACT
- 12% have emission limits
- 88% have work practice standards

Area 6J - GACT
- 1% have emissions limits
- 99% have work practice standards
Determining 5D & 6J Operating Requirements
5D Evaluating Operating Requirements

Four criteria drive MACT:

• New vs existing
• Fuel
• Combustor design
• Use limitations/Automated Combustion Controls
Three criteria drive GACT:

- New vs existing
- Fuel
- Size/Capacity

Also considers use limitations.
5D/6J New vs Existing

New vs existing

Existing: \( \leq 6/4/10 \)
New: Constructed \( > 6/4/10 \)
5D - 19 Subcategories
Combustor/Fuel

- Gas 1
- Gas 2
- Light liquid
- Heavy liquid
- Liquid non-continental
- Stokers w/dry biomass
- Fluidized beds w/biomass
- Suspension burner w/biomass
- Fuel cells w/biomass
- Hybrid suspension w/wet biomass
  • Stokers w/wet biomass
- Dutch oven pile burner w/solid biomass
- Pulverized coal/solid fossil fuel
- Stokers coal/solid fossil fuel
- Fluidized bed w/coal/solid fossil fuel
- Other w/coal/solid fossil fuel
- Fluidized bed w/heat exchanger w/coal/solid fossil fuel
- Metal process furnaces
- Limited Use
6J – 7 Fuel Categories

- Biomass (8 5D)
- Oil (3 5D)
- Oil ≤ 5 MM Btu/hr
- Coal/solid fossil fuel (5 5D)
- Limited Use
- Oxygen Trim Equipped
- Seasonal

(Exempt Gas [2 5D])
5D/6J Fuel Switching

- Switching subcategories requires:
  - 6J notification within 120  30 days and compliance within 180
  - 5D notification within 30 days and compliance dates vary see 63.7510

5D opt out to 6J must be federally enforceable and < 1/ 31/16 followed by above 6J notice
5D Size/Capacity

- Extra Large $\geq 30 \text{ MM Btu/hr}$
- Large $\geq 10 \text{ MM Btu/hr}$
- Small $<10 \text{ MM Btu/hr}$
- Extra Small Oil $\leq 5 \text{ MM Btu/hr}$
6J Size/Capacity

- Large $\geq 10$ MM Btu/hr
- Small $<10$ MM Btu/hr
- Oil $\leq 5$ MM Btu/hr
6J Emission Limits

Affected sources with emission limits include:

- New Coal, Oil and Biomass Boilers ≥ 10 MM Btu/hr
- Existing Coal ≥ 10 MM Btu/hr

See Table 1 within 6J of the CFR for emission limits
5D Reduced Requirements

Boiler/process heaters equipped with oxygen trim systems optimizing combustion efficiency have reduced requirements.

See if upgrade for less frequent tune-ups is cost effective!
Gas 1 units have no emission limits, so no stack testing and less reporting!

Gas 1 units still have to:

- submit notifications
- perform energy assessments
- perform tune-ups
- maintain records
- periodically report
5D Gas 1
Subcategory

- Burn only natural gas, refinery gas or gas with $\leq 40$ ug/m$^3$ mercury
- Burn liquid for periodic testing, maintenance, or operator training, $\leq 48$ hours per calendar year
- Otherwise only burn liquid during “periods of gas curtailment or supply interruption”
To reduce ongoing stack testing requirements, consider this strategy...

Light liquid units burning ultra-low sulfur fuel need only to perform an initial stack test. Fuel monitoring can be used thereafter to establish ongoing compliance with the emission limit.
Ultra low sulfur liquid fuel is distillate oil with \( \leq 15 \text{ ppm sulfur.} \)
Using stack test data, for each unit you must:

- Establish operating limits for each fuel and each pollutant
- Establish a maximum operating load
- Establish control specific operating limits
5D/6J Control Specific Operating Limits

Using control baseline data from stack testing, establish control operating limits consistent with Table 3 and 7 in 5D of the CFR:

• Minimum ESP secondary electric power input level

• Minimum scrubber flow rate & pressure drop
Establish continuous compliance with:

- Site specific monitoring plan
- See options in Table 8 within 5D of the CFR
- Use CEMS/COMS/CPMS, bag leak detection system, scrubber pH, fuel analysis, etc.
6J Stack Testing

Requires:

• Site specific test plan

• 60 day advance notification

• CEDRI reporting of results via compliance certification
6J Stack Testing

Requires subsequent test every 37 months (5D every 13 months)

Test using fuel or fuel mixture with the highest emission potential for each target pollutant (3 runs)

Table 4 within 6J of the CFR and 40 CFR 63.11212 lists stack test requirements
Conduct a fuel analysis to determine the fuel type or mixture, resulting in the maximum emission rates of Hg.

Table 5 within 6J of the CFR lists fuel analysis requirements.
6J Control Specific Operating Limits

Using control baseline data from stack testing, establish control operating limits consistent with Table 6 and 40 CFR 63.11222 of the CFR like:

- Minimum ESP secondary electric power input level
- Minimum scrubber flow rate & pressure drop
5D/6J One-time Energy Assessments

Applies to unit’s energy use system (e.g. facility HVAC, motors pumps fans, lighting supported by unit, etc.)

Not required of new units!
5D/6J One-time Energy Assessments

Required for all 5D existing units except:

- Gas 1 < 10 MM Btu/hr
- Limited-use units with federally enforceable limits
5D/6J One-time Energy Assessments

Required of all existing 6J units except:

- Existing < 10 MM Btu/hr
- limited use boilers
Comprehensive report detailing ways to improve energy efficiency, the cost of specific improvements, benefits, and the time frame for recouping the investments must be kept as part of facility operating record.
5D/6J Tune Ups

- Initial tune-up not required of new units for 5D and 6J
- Initial tune-up required for 5D existing units except existing Gas 1 < 10 MM Btu/hr
- Initial tune-up required for all 6J existing units except coal with ≥ 10 MM Btu/hr
5D/6J Tune Ups

Frequency following initial (existing) or startup (new):

- 5D – every 1, 2 or 5 years
- 6J – every 2 or 5 years (25 or 61 months)

No requirement to submit report, but must be maintained and available for inspection
5D & 6J
Records Summary
5D & 6J Records Summary

Maintain records showing:

• submittal of all required notifications and reports, including all supporting documentation

• stack tests along with site specific test plans
5D & 6J Records Summary

Maintain records showing:

• fuel analysis, use, hours

• operation and maintenance of control equipment, with a site specific monitoring plan

• operation and maintenance of CEMS/COMS/CPMS and bag leak detection systems
5D & 6J Reporting

- CEDRI - Compliance and Emissions Data
- Reporting Interface at https://cdx.epa.gov/
- Questions on CEDRI CEDRI@epa.gov
Major Source Permitting

Air Quality Division will work within Renewable Operating Permit renewals to align these reporting dates with existing ROP reporting requirements
Compliance Tools
Boiler NESHAP Resources

- DEQ Boiler NESHAP Web Page - Go to [www.michigan.gov/deqair](http://www.michigan.gov/deqair), select “Clean Air Assistance,” then “Boiler NESHAP – MACT & GACT”

- Access to NESHAP & EPA Tools

- DEQ Boiler NESHAP Applicability Tool - COMING SOON!

- Boiler Decision Flowchart

- DEQ Category Specific Permit Templates
Wrap Up

Primary Requirements

– Emission limits
– One-time energy assessment
– Periodic tune-ups
– Performance Testing
– Monitoring
– Recordkeeping
– Notifications
Wrap Up

• Please share session question on index cards provided to help develop additional guidance

• For questions, e-mail InfoBOILERNESHAP@michigan.gov

Thank you & Questions?

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