



Federal Regulations Affecting Boilers and Process Heaters

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Technical Assistance Services Include:

 **Air
Water
Water
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 **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

NESHAP 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 DDDDD Major HAP
sources**

**6J - 40 CFR 63, NESHAP,
Subpart JJJJJJ (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**

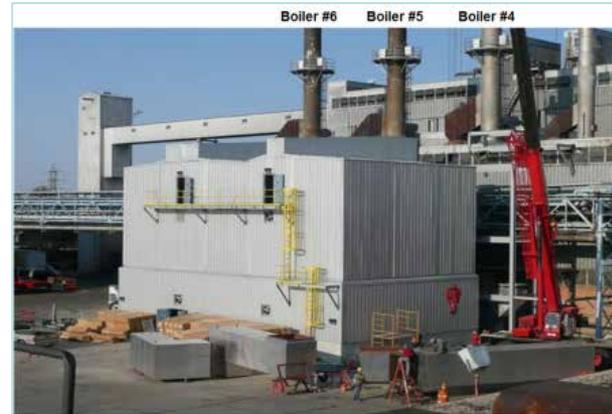
Boiler NESHAP Goals

- **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**

NESHAP Definitions

Major HAP Source

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

NESHAP Definitions

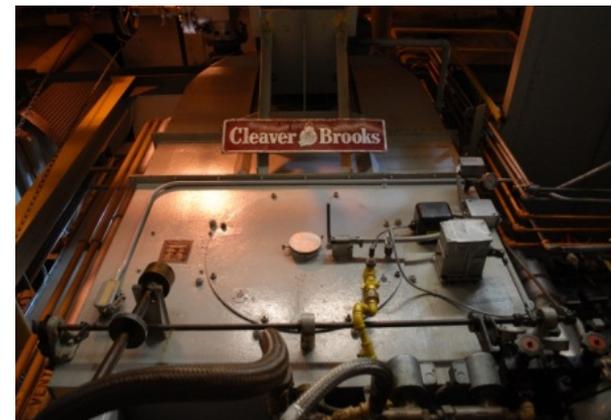
Area HAP Sources

- 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)**

5D& 6J Definitions

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!
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- **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**

6J ONLY Affected Source Exemptions

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

5D MAJOR

- HCl/SO₂
- TSM/PM
- CO
- Hg

6J AREA

- PM
- CO
- Hg

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**

6J Evaluating Operating Requirements

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 \leq 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 ≥ 30 MM Btu/hr**
- **Large ≥ 10 MM Btu/hr**
- **Small < 10 MM Btu/hr**
- **Extra Small Oil ≤ 5 MM Btu/hr**

6J Size/Capacity

- **Large ≥ 10 MM Btu/hr**
- **Small < 10 MM Btu/hr**
- **Oil ≤ 5 MM Btu/hr**

6J Emission Limits

Affected sources with emission limits include:

- **New Coal, Oil and Biomass Boilers \geq 10 MM Btu/hr**
- **Existing Coal \geq 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!**



5D Simplest Compliance Strategy

**Gas 1 units have no emission limits, so
no stack testing and less reporting!**

Gas 1 units still have to:

- ü submit notifications**
- ü perform energy assessments**
- ü perform tune-ups**
- ü maintain records**
- ü periodically report**

5D Gas 1 Subcategory

- **Burn only natural gas, refinery gas or gas with ≤ 40 ug/m³ mercury**
- **burn liquid for periodic testing, maintenance, or operator training, ≤ 48 hours per calendar year**
- **Otherwise only burn liquid during “periods of gas curtailment or supply interruption”**

5D Compliance Strategy

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.

5D Compliance Strategy

**Ultra low sulfur liquid fuel
is distillate oil with
 ≤ 15 ppm sulfur.**

5D/6J Establishing Operating Limits

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**

5D/6J Control Specific Operating Limits

**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

6J Fuel Analysis

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**

5D/6J One-time Energy Assessments Report

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 \geq 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, 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 InfoBOILERNEESHAP@michigan.gov

Thank you & Questions?

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