

Industrial Boiler MACT Compliance Planning: One Company's Perspective

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Citizens Thermal Energy

What is Citizens Thermal Energy?

- Formed on November 20, 2000, with the acquisition of the district energy assets from IPL
 - C.C. Perry K Steam Plant
 - West Street Chilled Water Plant
 - Indianapolis Campus Energy
 - Part of the public charitable trust that is Citizens Gas & Coke Utility
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The District Steam System

- Steam is distributed through ~24 miles of underground pipes to some 200 customers in the downtown area
 - Variety of fuels makes steam a low priced energy source:
 - Coal
 - Coke Oven Gas
 - Natural Gas
 - Municipal Solid Waste
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C.C. Perry K Steam Plant

- Originally constructed c. 1893 to supply electric power to Union Station
 - 8 boilers can supply up to 1.9 million pounds per hour of steam to the system
 - 3 coal-fired boilers
 - 3 gas-fired boilers
 - 2 oil-fired boilers
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Industrial Boiler MACT

- ❑ Category standard required by §112(d) of the Clean Air Act
 - ❑ Proposed in January 2003
 - ❑ Signed by EPA Administrator in February 2004
 - ❑ Published as a final rule on September 13, 2004
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Boiler MACT Was Proposed ...Now What?

- Process began with a series of questions:
 - Which boilers are affected?
 - What pollutants are regulated?
 - What monitoring/testing is required?
 - Where do we stand right now?
 - What comments must be made to ensure we have a voice in the process?
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Which Boilers Are Affected?

- At proposal, it was clear EPA was focusing on solid-fuel fired boiler
 - Existing gas and oil fired boilers have notification requirements, but no emission limits
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What Pollutants Are Regulated?

- Particulate matter
 - Known control technologies – the proposed standard didn't represent a big "unknown"
 - Hydrogen Chloride
 - Know some feasible methods for control, but don't know much more than AP-42 emission factors about emissions
 - Mercury
 - Don't know much about control, don't know much about emissions, save some data from AP-42 and the ICR
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How Do You Know What You Don't Know?

Bring on the Stack Testers!

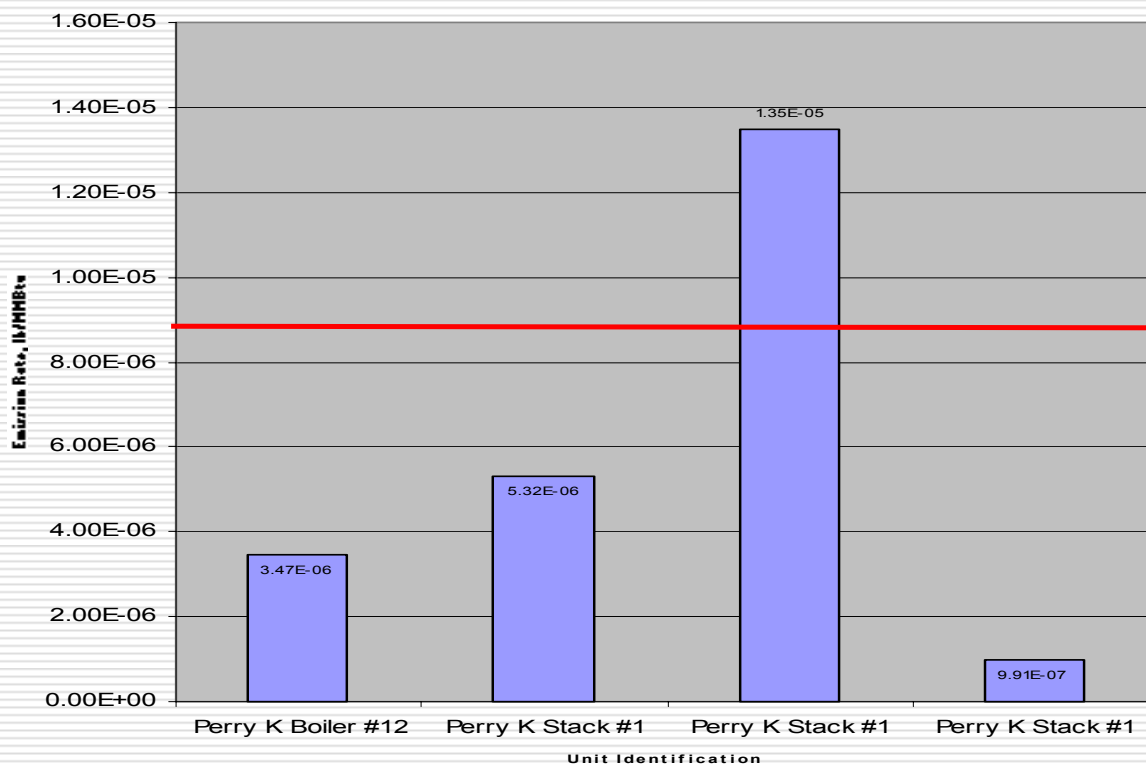
- Ontario-Hydro mercury testing
- HCl/Cl⁺² testing

But what about the fuel?

- Collect fuel samples for analysis:
 - Mercury content
 - Chlorine content
 - HAP metals (Arsenic, Beryllium, Cadmium, Chromium, Lead, Manganese, Nickel, and Selenium)
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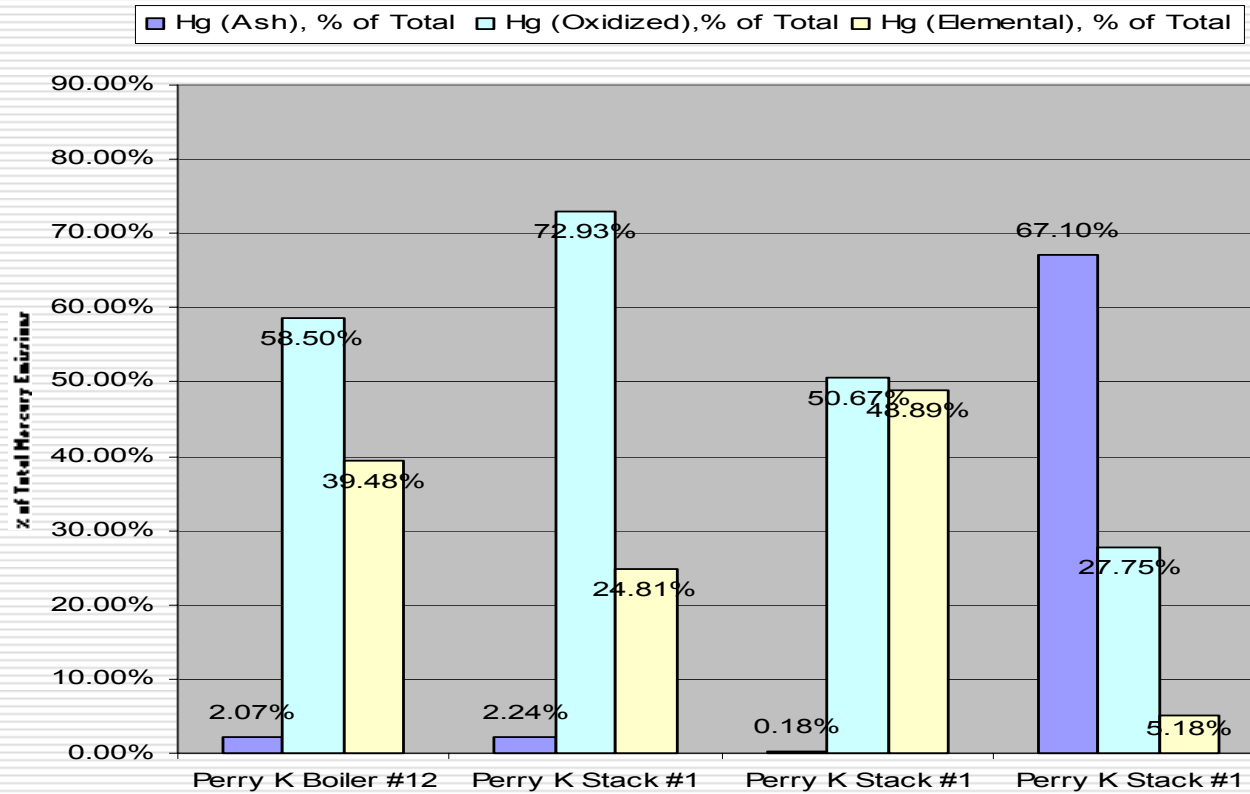
What Did The Stack Tests Show?

Total Hg, lb/MMBtu



How Was The Mercury Fractionated?

Comparison of Mercury Fractions, Ontario-Hydro Testing

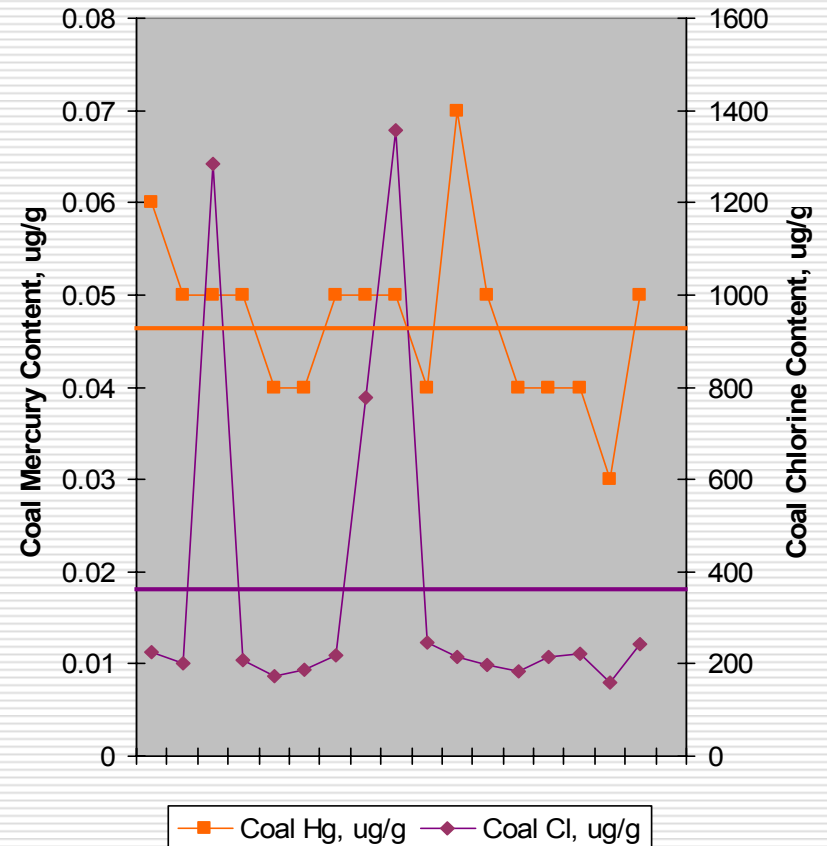


Speaking of Fuel Sampling

□ Coal samples collected in 2004 for mercury and chlorine analysis

■ Hg data:
min = 0.03
max = 0.07
std deviation = 0.009
mean = 0.046

■ Cl data:
min = 158
max = 1358
std deviation = 373
mean = 364



Multi-Emissions Compliance

- Study commissioned in 2003 to evaluate multitude of Clean Air Act programs that were on the table at the time:
 - BART
 - PM Transport (now "CAIR")
 - MACT
 - Attainment planning
 - Came out of the study with 3 viable options for long-term compliance
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Three Viable Options

- Natural gas conversion
 - Retrofit pollution control equipment
 - Build new CFB boilers
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- Current estimates indicate capital costs ranging from \$6M to \$180M
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What We Still Don't Know:

- Outcome of litigation
 - Possible impacts on emission limit(s) or compliance strategies?
 - Limits of the control technology
 - Mercury control efficiency on industrial boilers isn't well studied
 - Impact of fuel variability on compliance
 - IGS data: mean Hg content = 0.05 ug/g
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Where Are We Now?

- Evaluating financial impacts of the three compliance options
 - Impact on rates (steam is a regulated utility)
 - Costs (short-term versus long-term)
 - O&M impacts
 - Fuel diversity
 - The Clock is Ticking!
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Final Thoughts...

- When budgeting for future fiscal years, don't forget to increase \$\$ allocated for emissions testing
 - MACT requires annual testing for 3 years followed by one test every 3 years unless using fuel analysis as the compliance demonstration method
 - Don't forget to include parametric monitoring in compliance planning!
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