Overview of Mercury Monitoring Technologies and Regulatory Requirements

ICAC/MARAMA Mercury CEMS Webinar
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ICAC gives the air pollution control and monitoring industry a responsible and responsive presence in Washington, DC and throughout the country.
ICAC’S Mission

ICAC works constructively with state and federal government, business, public and private groups to ensure that our industry and its products are properly represented and understood.
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    • CEMS, Portables, DAHS, etc.
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State Mercury Regulations

- At least nineteen states have passed laws or regulations requiring emission reductions,
- Compliance schedules vary (one-phase; two-phase); 2008 to 2012 to 2015 timeframe.
- Some state rules include compliance flexibility if multi pollutant controls applied.
- Percentage reductions from 80 to 95 percent.
- Emission limits (0.25 to 0.6 to 1 lb/TBtu input) or output-based limits in lb/GW-hr
- Mercury monitoring requirements in the absence of vacated Part 75 requirements vary widely.
Colorado State Mercury Rule

- Implementation in 2012
- Phase I: 2012 & 2013: 80% reduction of Hg content of fuel or 0.0174 lb/GW hr annual reduction for two facilities (Pawnee and Rawhide)
- Phase 2: 2014 - 2016: 80% reduction of Hg content of fuel or 0.0174 lb/GW hr annual reduction for all coal
- Phase 3: 2017 and beyond: 90% reduction of Hg content of fuel or 0.0087 lb/GW hr annual reduction for all coal
Utility NESHAP: Mercury Monitoring Requirements

- Initial Compliance 30 boiler operating day CEMS data collection
- Continuing Compliance Hg CEMS or sorbent trap monitor
- Proposed certification and QA/QC similar to what was proposed for CAMR
- PS 12A (Hg CEMS) or PS 12B (sorbent trap monitors)
- Some concerns with calibration and measurement accuracy of low levels
Utility NESHAP: Proposed Mercury Emission Limits

- Coal-fired units designed for coal ≥ 8,300 Btu/lb
  - Existing units, 1.2 lb/TBtu
  - New units, 0.0002 lb/GWh

- Coal fired units designed for coal < 8,300 Btu/lb
  - Existing units, 11 lb/TBtu (4 lb/TBtu, beyond the floor)
  - New units, 0.02 lb/GWh
List of Mercury Specific National Emission Standards for Hazardous Air Pollutants (NESHAP)

<table>
<thead>
<tr>
<th>Rule</th>
<th>Rule Effective Date</th>
<th>Rule Status</th>
<th>Notes:</th>
</tr>
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<tbody>
<tr>
<td>Portland Cement</td>
<td>11/8/2010</td>
<td>Final Rule</td>
<td>Portions of rule are being litigated</td>
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<tr>
<td>ICI Boilers (area)</td>
<td>5/20/11</td>
<td>Final Rule</td>
<td></td>
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<tr>
<td>Utility Boiler</td>
<td>TBD</td>
<td>Proposed: 5/3/11</td>
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<tr>
<td>Gold mine ore processing (area)</td>
<td>2/17/11</td>
<td>Final Rule</td>
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<tr>
<td>Sewage Sludge Incinerators</td>
<td>5/20/11</td>
<td>Final Rule</td>
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<tr>
<td>Hospital/Medical/Infectious Waste Incinerator</td>
<td>4/6/2010</td>
<td>Final Rule</td>
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<tr>
<td>Municipal Waste Combustor (large)</td>
<td>11/6/2010</td>
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<tr>
<td>Iron/ Steel</td>
<td>TBD</td>
<td>Rule Development</td>
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Continuous Mercury Monitoring Technology

- Two forms of continuous mercury monitoring systems (CMMS)
  - Analyzer-based CEMS; and
  - Sorbent Traps (STs)
- Hg CEMS consist of a sample extraction component (probe), a sample conditioning component, an analytical component and a calibration system.
- Sorbent Traps consist of a paired sorbent media traps, moisture removal system, dry gas flow pump and dry gas flow meter.
- There are two leading analytical techniques:
  - AAS (Atomic Absorption Spectroscopy) and AFS (Atomic Fluorescence Spectroscopy)
CMM Schematics
Sorbent Trap
Continuous Mercury Monitoring Technology

- Hg CEMS are analyzers that continuously sample stack gas emissions.
- Hg CEMs offer real-time flue gas mercury concentrations.
- Hg CEMs offer reagent feed back optimization for ACI.

- STs have lower capital costs ($150K).
- STs are a simple system to operate and maintain.
- STs able to measure lower concentrations, however methodology dependent.
THANK YOU

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