Mercury Control at Western Fueled Plants

for
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Full-scale Tests Seek Solutions for Western Fuels

• All results are preliminary, short-term
  – Subject to change
  – Some indications, many questions
• ACI less effective at western-fueled plants with SD/BH than at other sites
  – Near-zero baseline capture
  – ACI << effective than at BH only sites
  – IAC $\Rightarrow$ high removals; many questions
• Chemical addition $\Rightarrow$ proportional oxidation, mixed results for capture by SD, PM scrubber
SD/BH Reduced Effectiveness of ACI

Note: Bituminous SD/BH > 90% w.o. ACI (per ICR)
Outlet Hg Emissions Vary: Bag Cleaning Effect

Typical industry cleaning cycle = 2 – 6 hr
Summary – ACI at Western-Fueled SD/BH Plant

• ACI achieved ~70% $\Delta$Hg short-term
  – Injection rate ~ 5x BH only
  – Performance beyond injection rate tested unknown
  – Emissions vary with cleaning

• Iodine impregnated carbon (IAC) achieved 90+%, single test, short term
  – Unit cost much higher; total cost?
  – Special carbon source; commercial availability?
  – Stability of iodine $\rightarrow$ corrosion, Hg re-release, iodine or Hg leaching
Mercury Oxidation Proportional to Created HCl Concentration

Flue Gas HCl Concentration (ppm HCl)

Mercury Oxidation, AH Outlet (Percent of Inlet)

- Cl1
- Cl2
- Cl3
Mercury Removal by SD/BH Depends on Injected Cl Compound

![Graph showing mercury removal across SD/BH as a function of flue gas HCl concentration with data points for Cl1, Cl2, and Cl3. The graph indicates that mercury removal increases with HCl concentration and is affected by Cl compounds, leading to corrosion and APH pluggage issues.]
Similar Effect at Wet Scrubber PRB Site

Flue Gas HCl Concentration (ppm)

Mercury Removal Across Scrubber (percent of inlet)

Max HCl correspond to 0.1-0.2% Cl in coal
Chemical Additives Promising, But Need…

- Understand compound-dependent removals
- Manage air heater pluggage
  - Worst with most effective Hg removal compound
- Assess boiler slagging, tube deposition, corrosion
- Counter opacity increase at wet particulate scrubber
- Determine impact on other air emissions
- Quantify total, long-term cost