

Hazardous Air Pollutants

Proposed Rule

- National Emission Standards for Hazardous Air Pollutants from Coal- and Oil-fired Electric Utility Steam Generating Units
- EGU MACT
- Power Plant MATS

- Rule proposed March 2011
- Comment period closed last week
- Final rule expected no later than November 2011
- Compliance 3 years after final rule publish date

Pollutants Covered

- Non-mercury HAP metals
- Acid gases
- Mercury

Non-mercury HAP Metals

- Antimony
- Arsenic
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Lead
- Manganese
- Nickel
- Selenium

Non-mercury HAP Metals

- Individual HAP metal limit, or
- Total particulate matter limit (0.030 lbs/MMBtu), or
- Total HAP metal limit (0.000040 lbs/MMBtu)

Non-mercury HAP Metals

- Control technologies, typical PM control devices
 - Electrostatic precipitators
 - Baghouse
- Compliance demonstration
 - PM CEMS
 - Performance testing

Mercury

- Mercury limit (1.0 lb/TBtu)
- Control technologies
 - Activated carbon injection
 - PM control device
- Compliance demonstration
 - Mercury CEMS, or
 - Sorbent trap
 - Performance testing

Acid Gases

- Hydrogen chloride (0.0020 lbs/MMBtu), or
- Sulfur dioxide (0.20 lbs/MMBtu), only if flue gas desulfurization installed.

Acid Gases

- Control technologies
 - Wet scrubber
 - Dry scrubber
 - Dry sorbent Injection
- Compliance demonstration
 - HCl CEMS, or
 - HF CEMS, or
 - SO₂ CEMS
 - Performance testing

Dry Sorbent Injection

- Alma 4 and 5
 - 50 and 72 MW, respectively
 - Built 1957 and 1960, respectively
 - Low-NO_x burners and overfire air
 - Selective non-catalytic reduction
 - Electrostatic precipitators

Dry Sorbent Injection

- Low capital cost (\$8MM vs \$60MM DFGD)
- Inject Trona (sodium sesquicarbonate) or sodium bicarbonate
- Neutralizes SO₂ and HCl
- Byproducts sodium chloride and sodium sulfate

Dry Sorbent Injection

- Sorbent costs
 - Trona \$150/ton
 - Sodium bicarbonate \$250/ton
 - Pebble lime \$120/ton
 - Approximately 1/3 less sodium bicarbonate vs. trona
- Can ESP meet PM limit with DSI?

Costs

- DSI \$5MM
- ESP conversion to baghouse \$3.5MM
- DFGD \$160MM – 400 MW
- ACI \$5MM
- Baghouse \$50MM – 400 MW
- PM CEMS \$250K
- Hg CEMS \$500K