GEOENERGY
A DIVISION OF
A.H. LUNDBERG ASSOCIATES, INC.

Wet ESPs for PM 2.5 Control from Utility Boilers

presented to

McIlvaine Hot Topics Web Seminar
May 12, 2011

by

Geoenergy Division of A.H. Lundberg Associates, Inc.

Regulatory Situation

- Utility Boiler MACT published in Federal Register May 3, 2011
  - Particulate limit <0.030 lb/MMBTU
  - HCl limit <0.002 lb/MMBTU
- Final Promulgation in November 2011

Likely Situation

- Coal-fired boiler with wet FGD
- Particulate emissions above MACT mandate

Define the Problem – What is the Source of the Particulate?

- Possibilities
  - Dry particulate escaping from dry ESP
  - Solids laden mist
  - Acid mist

Approaches

- Improve dry ESP
  - Gas flow improvements
  - Rapping improvements
  - Gas flow distribution improvements
  - Advanced power supplies and pre-charging
- Add-on to FGD
  - Improve mist eliminators
  - ***Add wet ESP***

Wet ESP Advantages

- ✓Proven technology for fine particles
- ✓Little added pressure drop
- ✓Little added parasitic load
- ✓No gas flow barrier
- ✓Excellent performance on all particles, liquid or solid
- ✓Install off line; tie in during brief outage

Wet ESP Performance

Power Off

Power On

Off/On Side by Side

Utility Wet ESP Experience

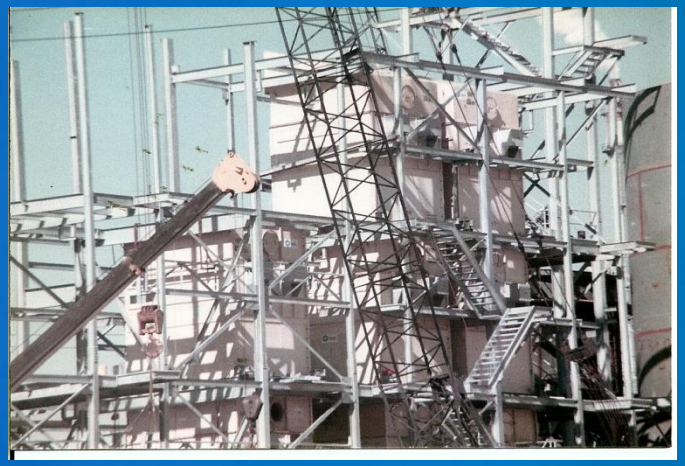
- 6 units in operation on NA major utility sources
- 2 large systems in construction on utility projects
- Many in operation on industrial boilers

First Energy Burger Station

- 50 MW capacity
- Installed/operated as demonstration unit by Powerspan for multi-pollutant process
- Operated 2004 through 2010
- Excellent reliability and performance

AES Deepwater 1985

- 150 MW capacity
- Operating since 1986
- Petroleum coke fired
- Designed to control sulfuric acid mist



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