

Reinhold Environmental Ltd.



***2007 APC Round Table & Expo
Presentation***

***July 8-10, 2007
Chattanooga, TN
Hosted by TVA***

Continuous Particulate Mass Monitors for Wet Scrubber Stacks

Reinhold APC Round Table, July 10, 2007

Participants:

Craig Clapsaddle, MSI/Mechanical Systems, Inc.

Phillip Zyskowski, Sick Maihak

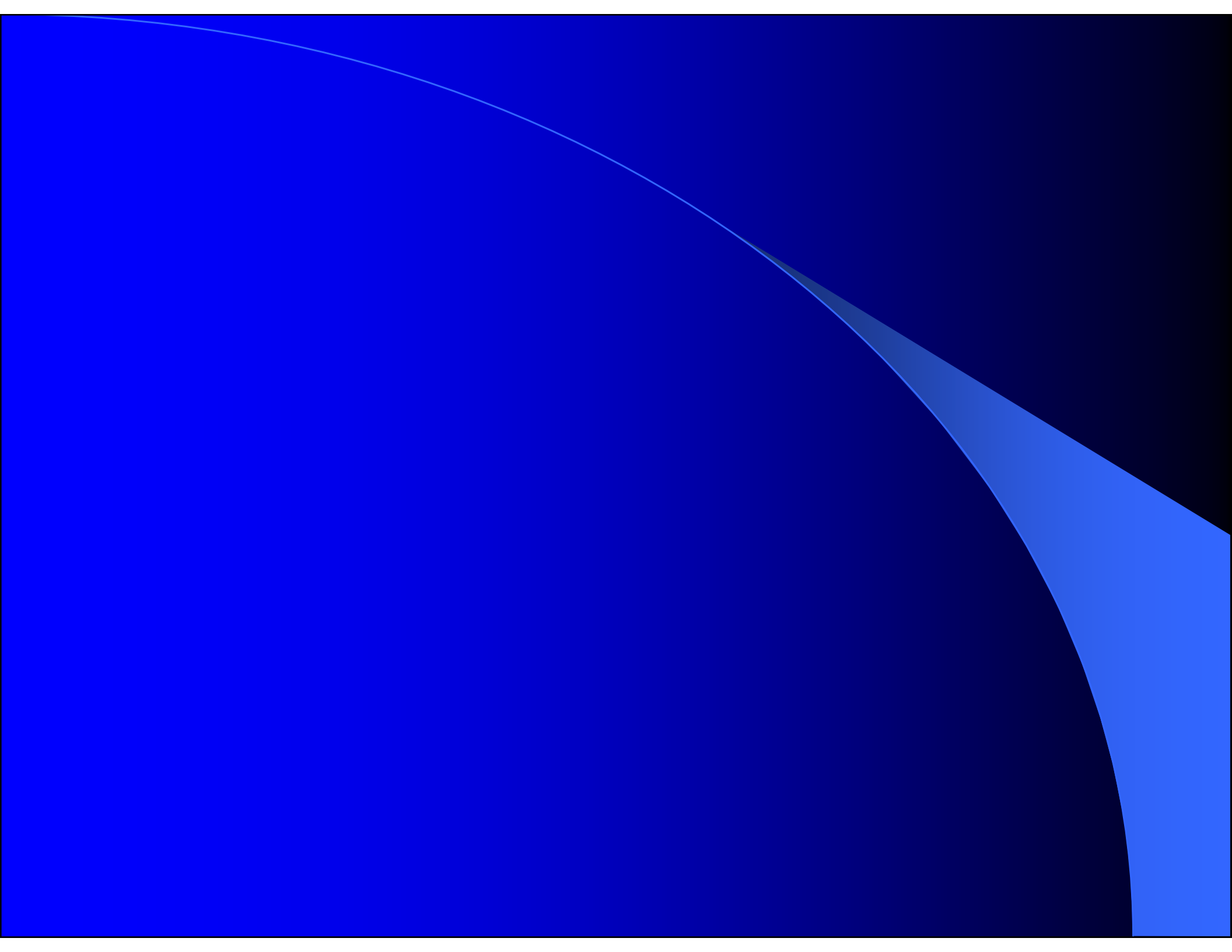
Peter Struckmann, E.ON-Engineering

David Nuckols, Dominion Generation

Steve Noland, Western Kentucky Energy

Why PM CEMS?

- New Subpart Da rules
 - allow PM CEMS
 - make the use of opacity monitors and parameter monitoring very onerous
 - make the use of PM CEMS at existing plant's new scrubber installations easy to propose and easy for agencies to approve as alternative to duct mounted COMS
- Most new power plant permits require PM CEMS
- Particulate monitoring after a wet scrubber can provide fuel flexibility and operational flexibility making a plant more profitable
- How can you prove your plant is maintaining PM levels with the addition of control systems for Hg & SO₃ – measure it



BetaGuard PM Particulate Monitor

- Direct measure of mass concentration
- Replicates EPA Methods 5, 5B
- NIST traceable mass standards used to calibrate monitor's mass measurement
- Beta attenuation mass measurement is not dependent on particle characteristics
- Dilution sampling technology
- Isokinetic sampling
- Automatic daily mass and flow drift checks
- Designed for long-term unattended operation with high availability (>95%)
- Meets US EPA requirements



BetaGuard PM Sample Probe



Type: Dilution

Length: 3-12 feet

Weight: 40-80 lbs

Material: Corrosion Resistant

Rating: NEMA 4X/IP66

Power: From BetaGuard

BetaGuard PM Sample Transport


- Heated to reference method test temperature
- Chemically polished ½" 316 SS sample tube
- Diameter: 2.75" OD
- Weight: 1.5 lbs/ft
- Flow rate: 50 l/min
- Flow velocity: 30 fps
- Bend radius: 24 inches
- Length: Max 150 feet



BetaGuard PM Filter Tape

- Particulate collected on glass fiber filter tape
- Mass measured with a beta gauge
- Sample flow volume measured on both a wet and dry basis
- Concentration output mg/wscm – lb/mmBtu calculated using CO_2 and F-factor, lbs/hour calculated using flow



The background is a dark blue gradient that transitions to a lighter blue on the right side. A thin, light blue curved line starts from the top left and arcs across the upper portion of the slide.

BetaGuard PM Installations in Electric Utility Coal-fired Wet Scrubber Stacks

Tampa Electric

- Big Bend
- Unit 4 Stack
- February 2002



Dominion Generation

- Mt. Storm
- Unit 1 & 2 Stack
- July 2004



Western Kentucky Energy

- Henderson Municipal Power & Light
- Unit 2 Stack
- August 2005



We Energies

- Pleasant Prairie Power Plant
- Unit 1 and Unit 2 Stacks
- September 2006



Western Kentucky Energy

- Henderson Municipal Power & Light
- Unit 1 Stack
- February 2007

