FINIAL PROGRAM

International Conference on Air Quality
Mercury, Trace Elements, SO₂, and Particulate Matter

September 19–21, 2005, Marriott Crystal Gateway, Arlington, VA

Organized and Sponsored by:
Energy & Environmental Research Center (EERC)
U.S. Department of Energy (DOE) Office of Fossil Energy National Energy Technology Laboratory (NETL)
Center for Air Toxic Metals® (CATM®) Through U.S. Environmental Protection Agency (EPA)
Office of Research and Development National Center for Environmental Research
Electric Power Research Institute (EPRI)
Welcome to Air Quality V!

For assistance at any time, please stop by the Air Quality V Registration Desk.

**Technical Program**

**Sunday, September 18, 2005**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:30–8:30 p.m.</td>
<td>Opening Registration/Exhibit Opening with Appetizers and Cash Bar (Grand Ballroom)</td>
</tr>
</tbody>
</table>

**Monday, September 19, 2005**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30–8:30 a.m.</td>
<td>Registration, Exhibits Open, and Continental Breakfast</td>
</tr>
<tr>
<td>8:30–10:00 a.m.</td>
<td>Opening Plenary Session – Arlington Ballroom, Salons III and IV</td>
</tr>
</tbody>
</table>

**Welcomes**

Gerald H. Groenewold, Director, University of North Dakota Energy & Environmental Research Center (EERC) Gerald Groenewold has served as the Director of the EERC since 1987, where he leads a multidisciplinary science and engineering research team focused on the development, demonstration, and commercialization of energy and environmental technologies, including major program initiatives in the areas of air toxics and fine particulate matter.

**Keynote Presentations**

*The Honorable Byron L. Dorgan, U.S. Senator (D-North Dakota)* Senator Dorgan was reelected to the U.S. Senate in November 2004 by an overwhelming majority after serving two terms in the U.S. Senate and six terms in the U.S. House of Representatives. Throughout his career in both the House and Senate, Dorgan has fought for the interests of rural America. Dorgan has also been a leader in the fight to protect our most important priorities: Social Security, Medicare, education, and the environment. He serves as Chairman of the Democratic Policy Committee, is a ranking member of the Appropriations; Commerce, Science, and Transportation; and Energy and Natural Resources Committees, and is Vice Chairman of the Indian Affairs Committee.

*William Wehrum, Principal Deputy Administrator and Acting Assistant Administrator, Office of Air and Radiation, U.S. Environmental Protection Agency* As Principal Deputy Administrator and Acting Assistant Administrator for EPA’s Office of Air and Radiation (OAR), William Wehrum is in charge of programs addressing industrial and vehicle pollution, acid rain, stratospheric ozone depletion, radiation protection, indoor air quality, and global climate change. Mr. Wehrum has extensive experience with the Clean Air Act and EPA air programs as well as a variety of air issues, including New Source Review reform, the Clean Air Interstate Rule, and the Clean Air Mercury Rule.
Monday, September 19, 2005 (cont.)

10:00–10:30 a.m.  Break – Exhibits Open

10:30 a.m.–12:00 p.m.  Panel Discussion – Power Systems of the Future: Emission Control

Faced with aging power plants and increasing demand for electricity, electric power utilities are investigating options for new power plants. The decision on the type of power system is very difficult because of many unanswered questions. Some of these questions include: What will the future regulations of mercury, acid gases, and particulate be? Will CO₂ sequestration be required? What is the environmental impact? How reliable are these new systems? Are they fuel-flexible? What will the cost of electricity be? Clear answers to many of these questions are not available but will have a significant impact on the selection of the combustion or gasification system and associated air pollution control equipment for the power systems of the future. These unanswered questions also add risk to the utilities and investors and slow down the development of new power systems.

Session Coordinator and Moderator:

Steve Benson, Senior Research Manager, Energy & Environmental Research Center Dr. Steve Benson has performed research on inorganic transformations and ash behavior during combustion and gasification for the past 25 years. He currently develops projects and programs focused on power plant performance, environmental control systems, the fate of pollutants, computer modeling, and health issues.

Panelists:

Thomas Sarkus, FutureGen Project Director, U.S. Department of Energy National Energy Technology Laboratory, Pittsburgh, PA

Thomas Sarkus works at DOE’s National Energy Technology Laboratory, where he is the Project Director for FutureGen, a $1 billion government–industry initiative featuring an IGCC power plant that will coproduce electricity and hydrogen and will achieve near-zero greenhouse gas emissions through CO₂ sequestration. He previously worked on DOE’s Clean Coal demonstration programs.

Sean Black, Marketing Manager for Environmental Control Systems, ALSTOM Power, Inc., Knoxville, TN

Sean Black is responsible for market forecasting and strategy, technology licensing, marketing alliances, development of business plans in support of new product development, and coordination of internal efforts to promote existing and commercialize new technologies. He also participates in various corporate initiatives designed to coordinate ALSTOM’s overall strategy for marketing and product development. He has 15 years of experience working in both the air pollution control and energy industries in Europe and the United States.

Norman Shilling, Product Line Leader, IGCC Power, GE Power Systems, Schenectady, NY

Dr. Norman Shilling is responsible for product line leadership for GE turbines applied to IGCC, new product development, syngas turbine applications, and market development. He has also held positions at GE Corporate R&D including Project Manager for Low-Emissions Locomotive Diesel Development and has collaborated with many GE businesses on pollution prevention and energy efficiency initiatives.

Everett Sondreal, Principal Research Advisor, Energy & Environmental Research Center, Grand Forks, ND

Dr. Everett Sondreal is the Principal Research Advisor at the EERC. Prior to his current position, he was the Director of the DOE Grand Forks Energy Technology Center, where he directed the planning and implementation of the DOE-led mission for western U.S. low-rank coals. His principal areas of expertise are in energy research and development, coal properties, and clean coal technology.

David Schmitz, Vice President, Engineering and Construction, Basin Electric Power Cooperative, Bismarck, ND

David Schmitz is responsible for centralized engineering services for new and existing generation and transmission facilities. The current focus of his work is on new resource development including environmental and technology options. He has been with Basin Electric for over 33 years in various positions in operations, engineering, and project management.

John Hendricks, Manager, New Generation, Environmental Licensing, American Electric Power, Columbus, OH

John Hendricks began working for AEP as an Environmental Chemist and has held various positions within AEP Environmental Services and AEP Resources focused on compliance issues on AEP’s existing fleet, regulatory development, and acquisition/divestiture efforts. Prior to his current position, he served as Manager of Environmental Compliance for AEP’s Natural Gas, River Transportation, and Coal Operations.

12:00–1:30 p.m.  Lunch and Luncheon Keynote Address

Carl O. Bauer, Director, U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) As Director of NETL, Carl Bauer oversees the implementation of major science and technology development programs to resolve the environmental, supply, and reliability constraints of producing and using fossil resources. This involves technologies for advanced coal-fueled power generation and hydrogen production, carbon sequestration, environmental control for the existing fleet of fossil steam plants, and improving the efficiency and environmental quality of domestic oil and natural gas exploration, production, and processing. Mr. Bauer has more than 30 years of experience in technical and business management in both the public and private sectors.
Stream B  Arlington Ballroom, Salon IV

Session B1 – SO₃

Session Coordinator:
Steven Benson, Senior Research Manager, EERC, Grand Forks, ND, USA

Session Chair:
Bernard Hamel, Chief Technology Officer, Marsulex Environmental Technologies, Philadelphia, PA, USA

Presenters:
“Development of a Low-Maintenance, Field-Ruggedized SO₃ CEM,” Joseph McCain, Senior Staff Physicist, Southern Research Institute, Birmingham, AL, USA; with R. Saltzmann, AMETEK, Inc., Wilmington, DE, USA; and B. Carney, DOE NETL, Morgantown, WV, USA

“In-Situ’ SBS Injection™ Technology for SO₃ Control: Summary of Operating Performance and Economics,” Sterling Gray, with S. Miller, URS Corporation, Austin, TX, USA; F. Meserole, Codan Development LLC, Austin TX, USA; and M. Harpenau, Cinergy Corporation, Owensville, IN, USA


“Successful Mitigation of SO₃ by Employing Dry Sorbent Injection of Trona Upstream of the ESP,” John Maziu, Technical Development Manager, Solvay Chemicals, Inc., Houston, TX, USA

“Field Estimates of Primary and Secondary Sulfate in Coal-Fired Power Plant Plumes,” Eric Edgerton, President, Atmospheric Research & Analysis, Inc., Cary, NC, USA; with J. Jansen, Southern Company, Birmingham, AL, USA; and B. Hartsell, ARA Inc., Plano, TX, USA

Stream A  Arlington Ballroom, Salon III

Session A1 – Mercury Health Issues

Session Coordinator:
Nicholas Ralston, Research Scientist, EERC, Grand Forks, ND, USA

Session Chairs:
P. Michael Bolger, Toxicologist, U.S. Food and Drug Administration; Center for Food Safety and Applied Nutrition, College Park, MD, USA

Annette Rohr, Project Manager, Air Quality Health and Risk Assessment, EPRI, Palo Alto, CA, USA

Presenters:
1:30 p.m.  “Fish Consumption, Methylmercury, and Human Heart Disease,” Frederick Lipfert, Consultant, Northport, NY, USA; with T. Sullivan, Brookhaven National Laboratory, Upton, NY, USA

1:55 p.m.  “Local Impacts of Mercury Emissions from Coal-Fired Power Plants,” Terry Sullivan, with B. Bowerman, J. Adams, and L. Milian, Environmental Research and Technology Division, Brookhaven National Laboratory, Upton, NY, USA; F. Lipfert, Consultant, Northport, NY, USA; S. Subramaniam, Miles College, Fairfield, AL, USA; and R. Blake, New York City College of Technology, Brooklyn, NY, USA

2:20 p.m.  “In-Field Diagnosis of a Chronic Mercury Intoxication in Small-Scale Gold Mining Areas,” Gustav Drasch, Senior Toxicologist, with S. Boese-O’Reilly, B. Lettmeier, K. Drasch, A. Maydl, and G. Roider, Institute of Forensic Medicine, Ludwig-Maximilians University, Munich, Germany

2:45 p.m.  “Mercury’s Effect on Selenium: Physiological Implications,” Nicholas Ralston, Biomedical Research Scientist, with L. Raymond, EERC, Grand Forks, ND, USA

3:10 p.m.  “Selenium’s Effect on Mercury: Environmental Implications,” Laura Raymond, Research Manager, with N. Ralston and C. Ralston, EERC, Grand Forks, ND, USA

3:35 – 4:05 p.m.  Break – Exhibits Open – Grand Ballroom
Monday, September 19, 2005 (cont.)

Session A2 – Mercury Policy and Regulations

Session Coordinator:
John Pavlish, CATM Director and Senior Research Advisor, EERC, Grand Forks, ND, USA

Session Chairs:
Thomas Feeley, Product Manager, Environmental and Water Resources, DOE NETL, Pittsburgh, PA, USA

William Maxwell, Environmental Engineer, Combustion Group/Emission Standards Division, EPA, Research Triangle Park, NC, USA

Presenters:
4:05 p.m. “EPA’s Clean Air Mercury Rule: An Overview,” Robert Wayland, Leader, Combustion Group, EPA, Research Triangle Park, NC, USA

4:30 p.m. “The Canada-Wide Standard for Mercury Emissions for Coal-Fired Electric Power Generating Plants,” John Mayes, Assistant Director, Standards Development Branch, Ontario Ministry of the Environment, Toronto, ON, Canada

4:55 p.m. “Litigation and Rulemaking: Pennsylvania’s Response to the Clean Air Mercury Rule,” Joyce Epps, Director, Bureau of Air Quality, Pennsylvania Department of Environmental Protection, Harrisburg, PA, USA

5:20 p.m. “Technical and Policy Issues Associated with the EPA Clean Air Mercury and Clean Air Interstate Rulemakings: Role of DOE,” Mitchell Baer, Senior Policy Analyst, Office of Policy and International Affairs; with D. Carter, Office of Fossil Energy, DOE, Washington, DC, USA

5:45 p.m. “Mercury Emissions and Electric Utilities: A Perspective on Policies,” Michael Rossler, Manager, Environmental Programs, Edison Electric Institute, Washington, DC, USA

6:10 p.m. Cash Bar/Social – Grand Ballroom

6:45 p.m. Dinner

After-Dinner Entertainment

Robert Priest’s Theater of the Mind . . . Entertainment in More Than Five Senses
Robert Priest is a mind reader. His Theater of the Mind show is an exciting and unique entertainment experience that makes the audience the stars of the show. Theater of the Mind is a skilled blend of mind reading, comedy, live action, laughs, and mental challenges. From a remarkable presentation of memorization, to an impossible blindfold routine, to an attention-grabbing, whole-audience mind reading, Theater of the Mind is the one show for mystery, drama, and comedy.
Session A3 – Mercury Measurement

Arlington Ballroom, Salon III

Session Coordinator:
Dennis Laudal, Senior Research Advisor, EERC, Grand Forks, ND, USA

Session Chairs:
Charles Dene, Manager, Emission Monitoring and Control, EPRI, Palo Alto, CA, USA
Jeffrey Ryan, Senior Scientist, National Risk Management Research Laboratory, EPA, Research Triangle Park, NC, USA

Presenters:
8:30 a.m. “The Status of EPA’s Hg CEM Field Test Program and Related Issues,” Robin Segall, Senior Environmental Scientist, Emissions Monitoring and Analysis Division, Office of Air Quality Planning and Standards, EPA, Research Triangle Park, NC, USA

8:55 a.m. “Characterizing Baseline Total Mercury Vapor Emissions Measurements at Detroit Edison Using QuickSEM™,” Scott Drennan, Manager of Engineering Services, with T. Nordgren, EPRI Solutions, Inc., Palo Alto, CA, USA; M. Mullin and M. McCoy, Detroit Edison, Detroit, MI, USA; and C. Dene, EPRI, Palo Alto, CA, USA

9:20 a.m. “The Precise and Accurate Certification of Mercury in Nitrogen from Gas Cylinders and Mercury Gas Generators,” Gerald Mitchell, with W. Dorko, Analytical Chemistry Division, Chemical Science and Technology Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, USA

9:45 a.m. “Quantitative Detection of HgCl₂ by Laser Photofragment Emission,” Thomas Reichardt, Senior Member of the Technical Staff, Remote Sensing and Energetic Materials Department, Combustion Research Facility, with A. Hoops and D. Kliner, Sandia National Laboratories, Livermore, CA, USA

Session B3 – EPA STAR Progress Review: Hg Transport, Transformation, and Fate in the Atmosphere

Arlington Ballroom, Salon IV

Session Coordinator and Chair:
William Steltz, Project Officer, National Center for Environmental Research and Quality Assurance, EPA, Washington, DC

Presenters:
8:30 a.m. “Speciated Atmospheric Mercury: Gas/Particle Partitioning, Transformations, and Source Characterization,” James Schauer, Associate Professor, with J. Hurley, D. Armstrong, B. Hall, H. Manolopoulos, and A. Rutter, University of Wisconsin-Madison, Madison, WI, USA; D. Krabbenhoft and M. Olson, U.S. Geological Survey, Middleton, WI, USA; and D. Gross, Carleton College, Northfield, MN, USA

8:55 a.m. “Pulsed Laser Photolysis – Pulsed Laser Induced Fluorescence Studies of the Kinetics and Mechanism of the Recombination of Hg(0) with Chlorine and Bromine Atoms,” Anthony Hynes, Professor, with D. Donohoue and D. Bauer, Marine and Atmospheric Chemistry, Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, FL, USA

9:20 a.m. “Models for the Formation and Transport of Reactive Mercury: Results for Florida, the Northeastern U.S., and the Atlantic Ocean,” Sanford Sillman, Research Professor, with F. Marsik and G. Keeler, Department of Atmospheric, Oceanic, and Space Sciences, University of Michigan, Ann Arbor, MI, USA; K. Al-Wali, Department of Environmental Health Sciences, University of Michigan, Ann Arbor, MI, USA; and M. Landis, EPA, Research Triangle Park, NC, USA

9:45 a.m. “Long-Range Transport of Mercury to the United States,” Dan Jaffe, Professor of Environmental Science, with P. Swartzendruber, J. Dennison, and P. Weiss, University of Washington, Bothell, WA, USA; E. Prestbo, Frontier Geosciences, Inc., Seattle, WA, USA; L. Jaeglé and S. Strode, Department of Atmospheric Sciences, University of Washington, Seattle, WA, USA; and D. Jacob and N. Eckley Selin, Harvard University, Cambridge, MA, USA
Tuesday, September 20, 2005 (cont.)

Session A3 (cont.)

10:40 a.m.  
“Preliminary Results from a Mercury and PM2.5 Ambient Air Monitoring Program in Athens, Ohio,”  
Stephen Winter, Chemist, Technical Services Group, CONSOL Energy Inc., South Park, PA, USA; with  
R. Yatavelli, J. Fahrni, and M. Kim, Center for Air Quality; and K. Crist, Department of Chemical  
Engineering, Center for Air Quality, Ohio University, Athens, OH, USA

11:05 a.m.  
“A Novel Approach for the Field Calibration of Instruments Measuring Reactive Gaseous Mercury  
(RGM) in the Atmosphere,” Eric Prestbo, Senior Research Scientist – Atmospheric Trace Metals, with  
P. Kilner, Frontier Geosciences, Inc., Seattle, WA, USA; and D. Jaffe and P. Swartzendruber, University  
of Washington-Bothell, Bothell, WA, USA

11:30 a.m.  
“The Fate of Mercury in a Pilot-Scale Amine CO2 Scrubber at SaskPower Boundary Dam Station,”  
Dennis Laudal, Senior Research Advisor, with G. Dunham, EERC, Grand Forks, ND, USA; D. Smith,  
SaskPower, Regina, SK, Canada; S. Pletcher, DOE NETL, Morgantown, WV; and D. Rose, Environment  
Canada, Gatineau, QC, Canada

12:05 –1:30 p.m.  
Lunch and Luncheon Keynote Address – Grand Ballroom

The Honorable Kent Conrad, U.S. Senator (D-North Dakota) Senator Conrad is ranking member of the Senate Bud-  
get Committee and an expert on the budget process who has earned a national reputation as a deficit hawk for his  
efforts to impose discipline on the federal budget and safeguard Social Security and Medicare. A longtime member of  
the Agriculture Committee, he is known as an outspoken advocate for family farms and the rural communities that  
rely on U.S. agriculture. As a senior member of the Finance Committee, he is known for his special expertise on tax  
issues and his advocacy for rural health care through the Medicare program. A Bismarck native, Senator Conrad has  
served North Dakota in the Senate since his election in 1986.

Session A4 – Mercury Transformation, Plume,  
Atmospheric Reactions, and Modeling

Session Coordinators:
Ye Zhuang, Research Engineer, EERC, Grand Forks, ND, USA
Christopher Zygarlicke, Deputy Associate Director for  
Research, EERC, Grand Forks, ND, USA

Session Chairs:
David Krabbenhoft, Research Scientist, U.S. Geological  
Survey, Middleton, WI, USA

Christian Seigneur, Vice President of Air Quality  
Studies, Atmospheric & Environmental Research, Inc.,  
San Ramon, CA, USA

Session B4 – PM Control

Session Coordinator:
Stanley Miller, Senior Research Manager, EERC, Grand  
Forks, ND, USA

Session Chairs:
John Caine, General Manager, Southern Environmental,  
Inc., Pensacola, FL, USA

Daniel Costa, Chief, Pulmonary Toxicology Branch,  
National Health and Environmental Effect Research  
Laboratory, EPA, Research Triangle Park, NC, USA
Tuesday, September 20, 2005 (cont.)

Session A4 (cont.)

1:30 p.m.
"Strategies for Maximizing Mercury Oxidation Across SCR Catalysts in Coal-Fired Power Plants,” Constance Senior, Manager, Engineering R&D, Reaction Engineering International, Salt Lake City, UT, USA; with G. Spitznogle, American Electric Power, Columbus, OH, USA

1:55 p.m.
“Study of Mercury Oxidation by SCR Catalyst in an Entrained-Flow Reactor under Simulated PRB Conditions,” Chun Lee, Senior Research Scientist, with S. Lee (Korea Science and Engineering Foundation Visiting Scientist) and S. Serre, National Risk Management Research Laboratory, EPA, Research Triangle Park, NC, USA; Y. Zhao and J. Karwowski, ARCADIS G&M, Inc., Research Triangle Park, NC, USA; and T. Hastings, Cometech, Inc., Durham, NC, USA

2:20 p.m.
“Chlorine-Induced Mercury Transformation in a High-Temperature Coal Flue Gas,” Ye Zhuang, Research Engineer, with C. Zygarlicke, J. Thompson, and J. Pavlish, EERC, Grand Forks, ND, USA

2:45 p.m.
“Investigation of Mercury Transformations in Coal Power Plant Plumes Using a Dilution Sampler,” Andrew Grieshop, with A. Robinson, Mechanical Engineering and Engineering and Public Policy, Carnegie Mellon University, Pittsburgh, PA, USA; D. Laudal, EERC, Grand Forks, ND, USA; and M. McCoy, DTE Energy, Detroit, MI, USA

3:10 p.m.
“Interconversion of Emitted Atmospheric Mercury Species in Coal-Fired Power Plant Plumes,” Eric Prestbo, Senior Research Scientist – Atmospheric Trace Metals, with P. Swartzendruber, Frontier Geosciences Inc., Seattle, WA, USA; L. Levin, EPRI, Palo Alto, CA, USA; W. Aljoe, DOE NETL, Pittsburgh, PA, USA; J. Jansen and L. Monroe, Southern Company, Birmingham, AL, USA; D. Michaud, We Energies, Milwaukee, WI, USA; D. Laudal, R. Schulz, and G. Dunham, EERC, Grand Forks, ND, USA; and V. R. Vale, Tennessee Valley Authority, Muscle Shoals, AL, USA

3:35–4:05 p.m. Break – Exhibits Open – Grand Ballroom

Session B4 (cont.)

Presenters:
“AirControlNET – Enhanced Tool for Identifying Cost-Effective Control Strategies,” Larry Sorrels, Economist, Office of Air Quality Planning and Standards, EPA, Research Triangle Park, NC, USA

1:55 p.m.
“The Properties of Unburned Carbon and Their Effects on Electrostatic Precipitator Performance,” Cameron Martin, Director of Engineering, ADA-ES, Inc., Littleton, CO, USA; with V. Belba, Belba & Associates, Boulder, CO, USA; and R. Altman, EPRI, Chattanooga, TN, USA

2:20 p.m.
“Membrane-Based Wet Electrostatic Precipitation – Results from Pilot Testing Experience,” David Bayless, with L. Shi, G. Kremer, and B. Stuart, Ohio Coal Research Center, Ohio University, Athens, OH, USA; and J. Caine, Southern Environmental, Inc., Pensacola, FL, USA

2:45 p.m.

3:10 p.m.
“Fly Ash Conditioning to Control Particulate Emissions from Indian Electric Utilities,” Satendra Jain, Senior Manager, with S. Kapoor, Centre for Power Efficiency and Environmental Protection, National Thermal Power Corporation Ltd., Noida, India

4:05 p.m.
“Operating Experience with an Advanced Hybrid™ Filter at the Big Stone Power Plant,” Stanley Miller, Senior Research Manager, EERC, Grand Forks, ND, USA; with B. Swanson and T. Hrdlicka, Otter Tail Power Company, Fergus Falls, MN, USA; J. Rockey, DOE NETL, Pittsburgh, PA, USA; and J. Caine, Southern Environmental, Inc., Pensacola, FL, USA

4:30 p.m.
“Dust Cake Compression Analysis with Embedding Method,” Qiang Yao, Professional Company, with C. Zhang and H. Xu, Department of Thermal Engineering, Tsinghua University, Beijing, China
Tuesday, September 20, 2005 (cont.)

Session A4 (cont.)

4:55 p.m.
“Effect of Atmospheric Chemistry on Mercury Deposition in the United States,” Christian Seigneur, Vice President, Air Quality Studies, with K. Vijayaraghavan and K. Lohman, Atmospheric & Environmental Research, Inc., San Ramon, CA, USA; and L. Levin, EPRI, Palo Alto, CA, USA

5:20 p.m.
“An Overview of Atmospheric–Ocean Integrated Mercury Research Aimed to Understand the Mercury Cycle in the Mediterranean Region,” Nicola Pirrone, Head of Rende Division, with I. Hedgecock, G. Trunfio, F. Sprovieri, and S. Cinnirella, CNR – Institute for Atmospheric Pollution, Rende, Italy

Session B4 (cont.)

“Fine Particle and Trace Metal Emissions from Combustion of Industrial and Municipal Waste,” Terttaliisa Lind, Senior Research Scientist, with J. Hokkinen, and A. Moilanen, VTT Processes, Espoo, Finland; and J. Jokiniemi, VTT Processes and University of Kuopio, Kuopio, Finland

Poster Session – 5:45–8:30 p.m.  Grand Ballroom

Remarks by Congressman Earl Pomeroy

The Honorable Earl Pomeroy, Representative in Congress (D-North Dakota)  Congressman Earl Pomeroy was first elected to the House of Representatives in 1992. He serves on the Ways and Means Committee and the House Agriculture Committee, the only member of Congress with an assignment on both. At the beginning of the 108th Congress, he was elected Cochair of the bipartisan Rural Health Care Coalition, and he also serves as Cochair of the House Democratic Social Security Task Force.

Exhibits Open, Social, and Cash Bar

Session Coordinator:
Tom Erickson, Associate Director for Research, EERC

Control

“A New Noncarbon Sorbent for Removing Mercury from Flue Gases,” Gokhan Alptekin, Principal Engineer, with M. Dubovik and M. Cesario, TDA Research, Inc., Wheat Ridge, CO, USA

“Mercury Chemistry and Mössbauer Spectroscopy of Iron Oxides During Taconite Processing on Minnesota’s Iron Range,” Michael Berndt, Research Scientist, Minnesota Department of Natural Resources, St. Paul, MN, USA; with J. Engesser, Minnesota Department of Natural Resources, Hibbing, MN, USA; and T. Berquó, Institute for Rock Magnetism, University of Minnesota, St. Paul, MN, USA

“Mercury Control at Low-Rank Coal-Fired Power Plants by a Precombustion Thermal Treatment Process: Technoeconomic Study,” Alan Bland, Manager, Waste and Environmental Business Unit, with L. Johnson, Western Research Institute, Laramie, WY, USA; K. Sellakumar, Eaa Energy, Inc., Bridgewater, NJ, USA; G. Walling, Alliant Energy, Cedar Rapids, IA, USA; D. Steen, Montana–Dakota Utilities Co., Bismarck, ND, USA; and E. Klunder, DOE NETL, Pittsburgh, PA, USA

“Mercury Oxidation Across SCR Catalyst When Firing High-Sulfur Eastern Bituminous Coal,” John Calvello, Sales Manager, with A. Favale, Hitachi America, Ltd., Tarrytown, NY, USA; S. Straight, Louisville Gas and Electric Company, Louisville, KY, USA; and Y. Nagai and I. Morita, Akitsu Works, Babcock–Hitachi K.K., Hiroshima-ken, Japan

“A Novel Hg Control Technology Derived from Quantum Chemistry,” Maohong Fan, with G. Norton and R. Brown, Center for Sustainable Environmental Technologies, Iowa State University, Ames, IA, USA
Poster Session (cont.)

“Kinetics of Ca/C Synergism During Mercury Adsorption on Fly Ash in Coal-Fired Power Stations,” Thomas K. Gale, Senior Engineer/Scientist, Environment, Energy, and Engineering Division, Southern Research Institute, Birmingham, AL, USA; with N. Bhopatkar and H. Ban, Mechanical Engineering Department, University of Alabama at Birmingham, Birmingham, AL, USA

“Parametric Evaluation of the Fate of Activated Carbon When Injected into an Electrostatic Precipitator,” Thomas Gale, Senior Engineer/Scientist, with R. Heaphy, Southern Research Institute, Birmingham, AL, USA; J. Irvin and M. Berry, Southern Company Services, Birmingham, AL, USA; R. Chang, EPRI, Palo Alto, CA, USA; and R. Altman, EPRI, Chattanooga, TN, USA

“The KFx Process for Low-Rank Coals,” Carrie Atiyeh Kowalski, Environmental and Legislative Analyst, KFx Inc., Denver, CO, USA

“Mercury Oxidation and Removal in the Gas-Cleaning System of Bituminous Coal-Fired Units,” Cristina La Marca, with A. Bianchi, C. Cioni, and S. Malloggi, Research Department, Enel S.P.A. - Generation and Energy Management, Pisa, Italy

“Coal Reburning for NOx and Mercury Control,” Vitali Lissianski, Project Leader, with R. Seeker and P. Maly, GE Energy, Irvine, CA, USA

“The Impact of Turbulent Mixing on Sorbent Dispersion in Coal-Derived Flue Gases,” Jens Madsen, Senior Consulting Engineer, Fluent Inc., Morgantown, WV, USA; with T. Starns, ADA-ES, Inc., Littleton, CO, USA; and W. Rogers and T. O’Brien, DOE NETL, Morgantown, WV, USA

“Mercury Retention in Fly Ash Fractions in Coal Combustion and Gasification Atmospheres,” M. Rosa Martínez-Tarazona, Head of Environmental Chemistry, with M. Díaz-Somoano, M.A. López-Antón, I. Suarez Ruiz, and A.B. García, National Coal Institute (CSIC), Oviedo, Spain

“Elemental Mercury Removal from Subbituminous Flue Gas Streams with Photochemical Oxidation,” Christopher McLarnon, Vice President, Research & Development, Powerspan Corporation, New Durham, NH, USA; with E. Granite and H. Pennline, DOE NETL, Pittsburgh, PA, USA

“Oxidation of Mercury on DNX Catalysts,” Henrik Guldberg Pedersen, Haldor Topsoe A/S, Lyngby, Denmark; with L. Storm Pedersen and H. Restgaard, Energi E2, Copenhagen, Denmark; and K. Pedersen, Haldor Topsoe, Lyngby, Denmark

“Geographic Variation of Mercury and Other Elements in U.S. Coal,” Jeffrey Quick, Geologist, with D. Tabet, S. Wakefield, and R. Bon, Utah Geological Survey, Salt Lake City, UT, USA; and T. Brill, Utah Energy Office, Salt Lake City, UT, USA

“Chlorinated Carbon Sorbents: How Is the Chlorine Attached?,” Ramesh Sharma, Research Scientist, with E. Olson and C. Crocker, EERC, Grand Forks, ND, USA

“Removing Hg from Flue Gas Using Activated Carbon Honeycomb,” Youchun Shi, Senior Research Scientist, with K. Gadkaree and D. Dawson-Elli, Corning, Inc., Corning, NY, USA

“Homogeneous and Heterogeneous Hg Chlorination Kinetics Study Using Two Different Techniques,” Philip Taylor, with R. Brahman and T. Yamada, Environmental Engineering Group, University of Dayton Research Institute, Energy and, Dayton, OH, USA


“Control of Mercury Emissions by Absorption on Fly Ash – Final Experimental Results of the CONSOL/Allegheny Pilot Plant Program,” Richard Winschel, Director of Coal Utilization, with M. Fenger, CONSOL Energy Inc., South Park, PA, USA; K. Payette, Allegheny Energy Supply, LLC, Greensburg, PA, USA; and L. Brickett, DOE NETL, Pittsburgh, PA, USA

“The Impact of Turbulent Mixing on Sorbent Dispersion in Coal-Derived Flue Gases,” Jens Madsen, Senior Consulting Engineer, Fluent Inc., Morgantown, WV, USA; with T. Starns, ADA-ES, Inc., Littleton, CO, USA; and W. Rogers and T. O’Brien, DOE NETL, Morgantown, WV, USA

“Oxidation of Mercury on DNX Catalysts,” Henrik Guldberg Pedersen, Haldor Topsoe A/S, Lyngby, Denmark; with L. Storm Pedersen and H. Restgaard, Energi E2, Copenhagen, Denmark; and K. Pedersen, Haldor Topsoe, Lyngby, Denmark

“Geographic Variation of Mercury and Other Elements in U.S. Coal,” Jeffrey Quick, Geologist, with D. Tabet, S. Wakefield, and R. Bon, Utah Geological Survey, Salt Lake City, UT, USA; and T. Brill, Utah Energy Office, Salt Lake City, UT, USA

“Chlorinated Carbon Sorbents: How Is the Chlorine Attached?,” Ramesh Sharma, Research Scientist, with E. Olson and C. Crocker, EERC, Grand Forks, ND, USA

“Removing Hg from Flue Gas Using Activated Carbon Honeycomb,” Youchun Shi, Senior Research Scientist, with K. Gadkaree and D. Dawson-Elli, Corning, Inc., Corning, NY, USA

“Homogeneous and Heterogeneous Hg Chlorination Kinetics Study Using Two Different Techniques,” Philip Taylor, with R. Brahman and T. Yamada, Environmental Engineering Group, University of Dayton Research Institute, Energy and, Dayton, OH, USA


“Control of Mercury Emissions by Absorption on Fly Ash – Final Experimental Results of the CONSOL/Allegheny Pilot Plant Program,” Richard Winschel, Director of Coal Utilization, with M. Fenger, CONSOL Energy Inc., South Park, PA, USA; K. Payette, Allegheny Energy Supply, LLC, Greensburg, PA, USA; and L. Brickett, DOE NETL, Pittsburgh, PA, USA
Poster Session (cont.)

**Health Issues, Policy, and Regulations**

“Relationship of Indoor and Ambient Particulate Matter to Respiratory Health in the Navajo Nation,” Joseph Bunnell, Public Health Research Biologist, U.S. Department of the Interior, U.S. Geological Survey, Reston, VA, USA, and Adjunct Assistant Professor, Department of Environmental and Occupational Health, George Washington University School of Public Health, Washington, DC, USA; with L. Garcia and M. Carroll, Dine College, Shiprock, NM, USA

**Measurement**


“Mercury Speciation in Flue Gas Using Dry-Based Conditioning with Atomic Fluorescence Spectrometry,” Warren Corns, R&D Manager, with P. Stockwell and M. Dexter, PS Analytical Ltd., Orpington, Kent, UK

“Mercury in Natural Gas and Liquid Streams,” Carlos Gotelli, Biochemist, with M. Gotelli, A. Lo Balbo, and L. Signorini, Centro de Investigaciones Toxicologicas, Buenos Aires, Argentina

“Impact of Biomass Co-Combustion and Combustion Conditions on Mercury Partitioning at Kingsnorth Power Station, UK,” Will Quick, E.ON UK plc, Nottingham, UK, with W. Corns, PS Analytical, Orpington, Kent, UK; J. Tembrink, E.ON Engineering, Gelsenkirchen, Germany; M. Cieplik, ECN, Petten, The Netherlands; H. Thorwarth, Stuttgart University, Stuttgart, Germany; and S. Bowden, Mitsui Babcock Energy Limited, Renfrew, Scotland


“An Evaluation of Mercury Measurement and Monitoring Results at a Subbituminous Coal-Fired Power Plant,” Volker Schmid, Special Projects Investigator, with J. Wright and A. Kephart, Clean Air Engineering, Inc., Pittsburgh, PA, USA; and A. Bland, Western Research Institute, Laramie, WY, USA

**Mercury and Coal Utilization By-Products**

“Gaseous Mercury Emission from Fly Ash Cellular Concretes During Steam Curing,” Chin-Min Cheng, Graduate Research Assistant, with H. Walker, D. Golightly, P. Sun, P. Taerakul, L. Weavers, and W. Wolfe, Department of Civil and Environmental Engineering and Geodetic Science, Ohio State University, Columbus, OH, USA

“Mercury Transport and Deposition: Alternate Data Sets,” Sid Nelson, Jr., President, Sorbent Technologies Corporation, Twinsburg, OH, USA

**Transformation, Plume, Atmospheric Reactions, and Modeling**

“Detailed Kinetic Modeling of Homogeneous Mercury Oxidation Reactions in a 1000-Btu/hr Quartz Furnace,” Brydger Cauch, Research Assistant, with A. Fry, J. Lighty, and G. Silcox, Department of Chemical Engineering, University of Utah, Salt Lake City, UT, USA

“Mercury Transport and Deposition: Alternate Data Sets,” Sid Nelson, Jr., President, Sorbent Technologies Corporation, Twinsburg, OH, USA

“Interdependence Between the Emission and Immission in the Atmosphere with Reference to Fine Particles PM1.0,” Jerzy Warych, Professor, with E. Palma, Department of Chemical and Process Engineering, Warsaw University of Technology, Warsaw, Poland

**Related Topics**

“Mercury and Other Trace Metals in Lichens Near Coal-Fired Power Plants: Annual Variability and Comparison to Historical Levels,” Robin Reash, Principal Environmental Scientist, with D. Long and R. Showman, American Electric Power, Environmental Services Department, Columbus, OH, USA

“Colorado’s Switch Removal Program: Limitations and Success in 2004 – A First-Year Evaluation,” Dena Wojtach, Environmental Protection Specialist, Colorado Department of Public Health and Environment, Air Pollution Control Division, Denver, CO, USA; with P. Tolley, Pull-n-Save Auto Parts LCC, Aurora, CO, Speedway Pull-n-Save Auto Parts LCC, Daytona Beach, FL, and Gary’s U-Pull it Inc., Binghamton, NY, USA
**Session A5 (A) - Control: Fundamentals/Science**

**Arlington Ballroom, Salon III**

**Session Coordinators:**
Michael Holmes, Deputy Associate Director for Research, EERC, Grand Forks, ND, USA
Chad Wocken, Research Engineer, EERC, Grand Forks, ND, USA

**Session Chairs:**
Jason Laumb, Research Manager, EERC, Grand Forks, ND, USA
Ravi Srivastava, Chemical Engineer, National Risk Management Research Laboratory, Air Pollution Prevention and Control Division, EPA, Research Triangle Park, NC, USA

**Presenters:**
7:40 a.m. “The Influence of Fly Ash Constituents on Mercury Speciation,” Harald Thorwarth, Research Engineer, with V. Stack-Lara, S. Unterberger and G. Scheffknect, University of Stuttgart, Institute for Verfahrenstechnik and Dampfkesselwesen (IVD), Stuttgart, Germany

8:05 a.m. “Properties of Unburned Carbons from Three Coal-Fired Power Plants and Their Relations to Mercury Capture,” Massoud Rostam-Abadi, Head, Energy and Environmental Engineering, Illinois State Geological Survey, Champaign, IL, and Adjunct Professor of Environmental Engineering, University of Illinois, Urbana, IL, USA; with Y. Lu and C. Funk, Illinois State Geological Survey, University of Illinois at Urbana-Champaign, Champaign, IL, USA; C. Richardson and J. Paradis, URS Corporation, Austin, TX, USA; and R. Chang, EPRI, Palo Alto, CA, USA

8:30 a.m. “The Influence of Induced Oxidation on the Operation of Wet FGD Systems,” Gabriele Boehm, Section Leader, Process Engineering, with H. Guterlet, E.ON Engineering GmbH, Gelsenkirchen, Germany

8:55 a.m. “Oxidation Kinetics and the Model for Mercury Capture on Carbon in Flue Gas,” Edwin Olson, Senior Research Advisor, with B. Mibeek, EERC, Grand Forks, ND, USA

---

**Session B5 – Mercury and Coal Utilization By-Products**

**Grand Ballroom, Salons J and K**

**Session Coordinators:**
David Hassett, Senior Research Advisor, EERC, Grand Forks, ND, USA
Debra Pflughoeft-Hassett, Senior Research Advisor, EERC, Grand Forks, ND, USA

**Session Chairs:**
David Goss, Executive Director, American Coal Ash Association, Aurora, CO, USA
James Roewer, Executive Director, Utility Solid Waste Activities Group, Washington, DC, USA

**Presenters:**
7:00–8:00 a.m. Continental Breakfast – Grand Ballroom Foyer

8:05 a.m. “Coal Combustion By-Products: Do We Need to Worry about Hg Releases,” Mae Sexauer Gustin, Associate Professor, with M. Xin and J. Ericksen, Department of Natural Resources and Environmental Sciences, University Nevada-Reno, Reno, NV, USA; K. Ladwig, EPRI, Palo Alto, CA, USA; D. Pflughoeft-Hassett, EERC, Grand Forks, ND, USA; and E. Swain, Minnesota Pollution Control Agency, St. Paul, MN, USA

8:30 a.m. “Evaluation of Fuel Samples and Process Byproducts from Full-Scale Mercury Control Evaluations Conducted on Coal-Fired Boilers Burning PRB Fuel,” Travis Starns, Senior Project Engineer, with S. Sjostrom, J. Amrhein, C. Sapp, C. Wilson, and E. Zipp, ADA-ES, Inc., Littleton, CO, USA; and C. Senior, Reaction Engineering International, Salt Lake City, UT, USA

8:55 a.m. “Update on ‘Concrete-Friendly’ Mercury Sorbents,” Charles Lockert, with Q. Zhou and Y. Zhang, Sorbent Technologies Corporation, Twinsburg, OH, USA
Wednesday, September 21, 2005 (cont.)

<table>
<thead>
<tr>
<th>Session A5 (B) – Control: Sorbent Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session Coordinators:</strong> Michael Holmes, Deputy Associate Director for Research, EERC, Grand Forks, ND, USA Chad Wocken, Research Engineer, EERC, Grand Forks, ND, USA</td>
</tr>
<tr>
<td><strong>Session Chairs:</strong> Lynn Brickett, Project Manager, DOE NETL, Pittsburgh, PA, USA Ramsay Chang, Manager, Integrated Environmental Controls, EPRI, Palo Alto, CA, USA</td>
</tr>
<tr>
<td><strong>Presenters:</strong></td>
</tr>
<tr>
<td>9:20 a.m. “An Update on the U.S. Department of Energy’s Phase II Mercury Control Technology Field Testing Program,” ThomasFeeley, III,TechnologyManager, Innovations for Existing Plants Programs, with L. Brickett, DOE NETL, Pittsburgh, PA, USA; A. O’ Palko, DOE NETL, Morgantown, WV, USA; and J. Murphy and A. Jones, Science Applications International Corporation, Pittsburgh, PA, USA</td>
</tr>
<tr>
<td>9:45 a.m. “Power Plant Mercury Control Results with Brominated PAC and ESPs,” Sid Nelson, Jr.,President, and Ronald Landreth, with X. Liu, Z. Tang, J. Miller, and A. Overholt, Sorbent Technologies Corporation, Twinsburg, OH, USA; S. Potter, R. MacMurray, D. Weaver III, and Q. Corey, Duke Power, Charlotte, NC, USA; M. McCoy and W. Rogers, Detroit Edison, Detroit, MI, USA; R. Syle and T. Ley, Apogee-Scientific, Denver, CO, USA; and L. Brickett, DOE NETL, Pittsburgh, PA, USA</td>
</tr>
<tr>
<td>10:10–10:40 a.m. Break – Grand Ballroom Foyer</td>
</tr>
<tr>
<td>10:40 a.m. “Sorbent Injection into a Slipstream Baghouse for Mercury Control: Screening and Parametric Results,” Jeffrey Thompson, Research Scientist, with J. Pavlish, EERC, Grand Forks, ND, USA; D. Smith and S. Podwin, SaskPower, Regina, SK, Canada; L. Brickett, DOE NETL, Pittsburgh, PA, USA; and L. Lindau, Global Technology, Växjö, Sweden</td>
</tr>
<tr>
<td>11:05 a.m. “Full-Scale Evaluations of Mercury Control for Units Firing Powder River Basin Coals,” Sharon Sjostrom, Director of Technology Development, with T. Starns, C. Wilson, J. Amrhein, M. Durham, and J. Bustard, ADA-ES, Inc., Littleton, CO, USA; A. O’ Palko, DOE NETL, Morgantown, WV, USA; and R. Chang, EPRI, Palo Alto, CA, USA</td>
</tr>
</tbody>
</table>

Session B5 (cont.)

<table>
<thead>
<tr>
<th><strong>Session B5 (cont.)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>“Distribution of Mercury in FGD Materials,” Candace Kairies, Research Assistant, with K. Schroeder and C. Cardone, DOE NETL, Pittsburgh, PA, USA</td>
</tr>
<tr>
<td>“Fate of Mercury in Synthetic Gypsum Used for Wallboard Production, Task 1,” Jessica Marshall, Product Safety Manager, USG Corporation, Chicago, IL, USA; with G. Blythe and M. Richardson, URS Corporation, Austin, TX, USA; and R. Rhudy, EPRI, Palo Alto, CA, USA</td>
</tr>
</tbody>
</table>

Session B6 – PM Measurement

<table>
<thead>
<tr>
<th><strong>Session Coordinator and Chair:</strong> Grant Dunham, Research Manager, EERC, Grand Forks, ND, USA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Presenters:</strong></td>
</tr>
<tr>
<td>10:40 a.m. “New Precise, Accurate, and Verifiable Metals Measurement System,” John Cooper, President, with B. Johnsen, D. Barth, P. Ginochio, M. Nakanishi, K. Petterson, C. Yance, and S. Fry, Cooper Environmental Services, Portland, OR, USA; R. Lambert and J. Owens, Eli Lilly and Company, Lafayette, IN, USA; and K. Hay, U.S. Army Corps of Engineers, Champaign, IL, USA</td>
</tr>
<tr>
<td>11:05 a.m. “Characterization of PM1.5 Trace Elements in Steubenville, Ohio, Using Dynamic Reaction Cell ICP–MS,” Daniel Connell, Associate Engineer, Coal Utilization Section, with S. Winter and V. Conrad, CONSOL Energy Inc., South Park, PA, USA</td>
</tr>
</tbody>
</table>
12:40 p.m.  “Full-Scale Activated Carbon Injection for Mercury Control in Flue Gas Derived from North Dakota Lignite and PRB Coal,” Katherine Dombrowski, Engineer, with C. Richardson and D. Frenzel, URS Corporation, Austin, TX, USA; T. Ley and T. Ebner, Apogee Scientific, Englewood, CO, USA; R. Chang, EPRI, Palo Alto, CA, USA; M. Strohfus, Great River Energy, Elk River, MN, USA; S. Smokey, Great River Energy Stanton Station, Stanton, ND, USA; and L. Brickett, DOE NETL, Pittsburgh, PA, USA

1:05 p.m.  “Field Testing of Mercury Control for Lignite-Fired Systems with Activated Carbon and Sorbent Enhancement Additives: Field Test Results from Antelope Valley Station,” Chad Wocken, Research Engineer, with M. Holmes, J. Pavlish, and K. Hill-Brandt, EERC, Grand Forks, ND, USA; B. Erickson, Basin Electric Power Cooperative, Bismarck, ND, USA; and L. Brickett, DOE NETL, Pittsburgh, PA, USA

1:30 p.m.  “Full-Scale Evaluation of Activated Carbon Injection,” Mark Berry, Principal Research Engineer, Southern Company Generation, Birmingham, AL, USA, and Carl Richardson, Senior Scientist, URS Corporation, Austin, TX, USA; with K. Dombrowski, URS Corporation, Austin, TX, USA; D. Chapman, DOE NETL, Morgantown, WV, USA; R. Chang, EPRI, Palo Alto, CA, USA; L. Monroe, Southern Company Generation and Energy Marketing, Birmingham, AL, USA; S. Glessman and T. Campbell, ADA–ES, Littleton, CO, USA; and K. McBea, Georgia Power Plant Yates, Newman, GA, USA

1:55 p.m.  “Large-Scale Demonstration of the MerCAP™ Technology for Mercury Control,” Kevin Fisher, Project Engineer, with T. Enner, T. Ley, and R. Slye, Apogee Scientific, Inc., Englewood, CO, USA; R. Chang, EPRI, Palo Alto, CA, USA; C. Richardson and T. Machalek, URS Corporation, Austin, TX, USA; William Ajole, DOE NETL, Pittsburgh, PA, USA; M. Strohfus, Great River Energy, Elk River, MN, USA; and S. Sjostrom, ADA-ES, Littleton, CO, USA

Session B6 (cont.)

“Challenges in Meeting Condensable Particulate Matter Emissions,” Robert Nicolo, Principal Engineer, with P. Carr, Bechtel Power Corporation, Frederick, MD, USA


Session B7 – Transport, Atmospheric Chemistry, and Modeling

Session Coordinator:
Kevin Galbreath, Research Manager, EERC, Grand Forks, ND, USA

Session Chairs:
John Jansen, Principal Scientist, Southern Company Services, Inc., Birmingham, AL, USA
C.V. Mathai, Manager for Environmental Policy, Pinnacle West/APS, Phoenix, AZ, USA

Presenters:
“Emission Rates and Ambient Contributions of Pollutants from Individual Sources Through Pseudo-Deterministic Multivariate Receptor Modeling of Highly Time-Resolved Metals and SO₂ Measurements,” John Ondov, Professor, with S.S. Park and J.P. Pancras, Department of Chemistry and Biochemistry, University of Maryland, College Park, MD, USA

“PM₁₅ Chemical Speciation Results for Texas,” Richard Tropp, Associate Research Professor, with S. Kohl, J. Chow, and J. Watson, Desert Research Institute, Reno, NV, USA; R. Countess and S. Countess, Countess Environmental, Westlake Village, CA, USA; and E. Michel, Texas Commission on Environmental Quality, Austin, TX, USA
Wednesday, September 21, 2005 (cont.)

Session A5 (B) (cont.)

2:20 p.m. “Full-Scale Testing of Mercury Emissions at Ontario Power Generation’s Nanticoke GS and the Potential for Mercury Control,” Robert Lyng, Environment Manager, Nanticoke GS, Ontario Power Generation Inc. (OPG), Nanticoke, ON, Canada, and Elan Thomas, Senior Scientist, Kinectrics Inc., Toronto, ON, Canada; with K. Curtis, Curtis Environmental Consulting, Port Severn, ON, Canada; and L. Marshall, Ontario Power Generation Inc., Nanticoke, ON, Canada

Session A5 (C) – Control: Scrub/Multipollutant Systems

Session Coordinators:
Michael Holmes, Deputy Associate Director for Research, EERC, Grand Forks, ND, USA
Chad Wocken, Research Engineer, EERC, Grand Forks, ND, USA

Session Chairs:
Scott Renninger, Mercury Control Specialist, The Babcock & Wilcox Company, Barberton, OH, USA
Carl Richardson, Senior Scientist, URS Corporation, Austin, TX, USA

Presenters:
2:45 p.m. “Pilot-Scale Testing of Mercury Oxidation Catalysts for Enhanced Control by Wet FGD,” Gary Blythe, Project Manager, URS Corporation, Austin, TX, USA; with R. Rhudy, EPRI, Palo Alto, CA, USA; and B. Lani, DOE NETL, Pittsburgh, PA, USA

3:10–3:30 p.m. Break – Grand Ballroom Foyer

3:30 p.m. “A Pilot-Scale Evaluation of the ElectroCore Technology as a Multipollutant Control Technology,” Mark Berry, Principal Research Engineer, with J. Kyle, Southern Company Generation and Energy Marketing, Birmingham, AL, USA; B. Zemo, Alabama Power Company, Gadsden, AL, USA; R. Altman, EPRI, Chattanooga, TN, USA; and E. Gottung, B. Easom, L. Bertuccioli, and L. Hinman, United Technologies Corporation, East Hartford, CT, USA

3:55 p.m. “Enhanced Mercury Control by Wet FGD Systems,” Joe Lally, Senior Applications Specialist, Degussa Corporation, Parsippany, NJ, USA; with D. DeBerry, J. Currie, and G. Blythe, URS Corporation, Austin, TX, USA; R. Peid Szus, Degussa Corporation, Parsippany, NJ, USA; R. Rhudy, EPRI, Palo Alto, CA, USA; and C. Miller and S. Pletcher, DOE NETL, Morgantown, WV, USA


Session B7 (cont.)

“Sulfate Changes with Weather Effects Removed,” Stephen Mueller, Projects Manager and Environmental Research Scientist, Research & Technology Applications, Tennessee Valley Authority, Muscle Shoals, AL, USA

“A Case Study of the Effect of Anthropogenic Emissions in Asia on Regional Ozone Near Taiwan During a Spring Dust Storm Period,” Chung-Ming Liu, with M.-T. Yeh and Y.-C. Lee, Department of Atmospheric Sciences, National Taiwan University; D.J. Jacob and M. Fu, Department of Earth and Planetary Sciences and Division of Engineering and Applied Sciences, Harvard University; and G. Carmichiel and D. Streets, Department of Chemical & Biochemical Engineering, The University of Iowa, Iowa City, IA, USA

“Evaluating the Relative Effectiveness of Ozone Precursor Controls: Design of Computer Experiments Applied to the Comprehensive Air Quality Method with Extensions (CAMX),” Bryan Hubbell, Environmental Economist, Office of Air and Radiation, with P. Dolwick, EPA, Research Triangle Park, NC, USA; and D. Moorey and M. Morara, Battelle, Columbus, OH, USA
## Exhibit Schedule

<table>
<thead>
<tr>
<th>Sunday, September 18</th>
<th>Registration</th>
<th>6:30 – 8:30 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday, September 19</td>
<td>Registration/Continental Breakfast</td>
<td>7:30 – 8:30 a.m.</td>
</tr>
<tr>
<td></td>
<td>Morning Break</td>
<td>10:00 – 10:30 a.m.</td>
</tr>
<tr>
<td></td>
<td>Lunch</td>
<td>12:00 – 1:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>Afternoon Break</td>
<td>3:35 – 4:05 p.m.</td>
</tr>
<tr>
<td>Tuesday, September 20</td>
<td>Continental Breakfast</td>
<td>7:30 – 8:30 a.m.</td>
</tr>
<tr>
<td></td>
<td>Morning Break</td>
<td>10:10 – 10:40 a.m.</td>
</tr>
<tr>
<td></td>
<td>Lunch</td>
<td>12:00 – 1:30 p.m.</td>
</tr>
<tr>
<td></td>
<td>Afternoon Break</td>
<td>3:35 – 4:05 p.m.</td>
</tr>
<tr>
<td></td>
<td>Exhibit Social/Poster Session</td>
<td>5:45 – 8:30 p.m.</td>
</tr>
</tbody>
</table>

### Air Quality V Exhibitor Layout

**Marriott Crystal Gateway Grand Ballroom and Foyer**

1. Tekran Inc.
2. Spectra Gases
3. Thermo Electron Corporation
4. Hitachi America Ltd.
5. Weston Solutions, Inc.
6. OhioLumex Company
7. M&C Products
8. Air Quality Analytical, Inc.
9. Mercury Research Center (Southern Research Institute)
10. Air Sampling Associates, Inc.
11. Electric Power Research Institute
12. Arizona Instrument, LLC
13. Clean Air Engineering
14. O’Brien & Gere
15. P S Analytical
16. Horiba Instruments, Inc.
17. Sorbent Technologies Corporation
18. Sorbent Technologies Corporation
19. SICK MAIHAK, Inc.
20. METCO
21. EERC
22. EERC
23. Baldwin Environmental, Inc.
Conference Sponsors

Organizing Sponsor
Energy & Environmental Research Center

The Energy & Environmental Research Center (EERC) is a research, development, demonstration, and commercialization facility recognized as one of the world’s leading developers of cleaner, more efficient energy technologies as well as environmental technologies to protect and clean our air, water, and soil. The EERC is a high-tech, nonprofit branch of the University of North Dakota, which operates like a business. The EERC currently employs more than 275 people and is aggressively expanding its staff. The Center was founded in 1951 as the Robertson lignite Research Laboratory, a federal facility under the U.S. Bureau of Mines. It became a federal energy technology center under the U.S. Department of Energy in 1977 and was defederalized in 1983. Today, the EERC leverages and enhances government research dollars by developing working partnerships with industry, government, and the research community. Since 1983, the EERC has had more than 840 clients in all 50 states and 47 countries. In FY2004, 90% of its contracts were funded by nonfederal entities.

Partnering Sponsors
U.S. Department of Energy Office of Fossil Energy National Energy Technology Laboratory

The Office of Fossil Energy’s National Energy Technology Laboratory (NETL) plans and implements its programs to accomplish the overall goals and objectives of the U.S. Department of Energy (DOE). NETL serves as the focal point for science and technology development in fossil energy and related environmental control technologies. Through the new Strategic Center for Natural Gas (SCNG), NETL will drive an integrated planning process for natural gas technologies within DOE and will coordinate DOE’s natural gas programs in gas supply, transmission, distribution, reliability, and end use. SCNG will identify research and policy support gaps; plan programs to fill these gaps; initiate research to meet future natural gas supply deliverability, reliability, and utilization requirements; and provide strong support for DOE’s development of natural gas-related policies.

With the four focus area leads, NETL will provide leading-edge research and development (R&D) leadership in gas energy systems dynamics, carbon sequestration, computational energy science, and ultraclean fuels. Through partnerships, NETL will continue to utilize the full resources of the laboratory system to address fossil energy-related issues. NETL concentrates on the application of science and engineering principles to execute its mission.

U.S. Environmental Protection Agency

The National Center for Environmental Research (NCER) was established in May 1995 as part of the overall reorganization of the Office of Research and Development (ORD) in the U.S. Environmental Protection Agency (EPA). NCER’s mission is to stimulate the research community to provide high-quality, innovative ideas and solutions to protect human health and the environment. NCER’s aims are to achieve excellence in research, focus on the highest-priority environmental science and engineering needs, achieve high levels of accountability and integrity, leverage resources and form partnerships, communicate/integrate research results, develop the next generation of environmental scientists, and provide ORD-wide policy development. The STAR Program, “Science To Achieve Results,” NCER’s largest and most visible initiative (accounting for 85% of its annual budget), funds research and fellowships in environmental science and engineering. The STAR Program is one of EPA’s tools for improving the scientific basis for decisions on national environmental issues and supports research covering a broad area of environmental topics. In addition, the STAR Program facilitates and expands access to research information and communicates science results through workshops, publications, and the Internet. The STAR Program has grown over the past 5 years and now awards $95 million annually and supports 900–1000 active grants and fellowships.

The EERC’s Center for Air Toxic Metals (CATM) Program is sponsored by a grant from the U.S. Environmental Protection Agency Office of Research and Development’s National Center for Environmental Research and by Affiliate members. The program is focused on conducting research directed toward minimizing the impact of air toxic metals on the environment, both in the United States and globally. Since its inception in 1993, CATM has proven to be effective at addressing critical air toxic issues through partnerships with government agencies, industry, and environmental groups. Through these partnerships, CATM has answered critical questions concerning health risks, toxic metal transformations and pathways, sampling and measurement of toxic metal emissions, and related toxic metal control technologies. Through outreach programs and open forums, the general public is made aware of air toxic emission issues and the need for pollution prevention as the first step toward improving air, water, and soil quality.

Platinum Sponsor
Electric Power Research Institute

The Electric Power Research Institute (EPRI) creates science and technology solutions for the global energy and energy services industry. The institute provides a wide range of innovative products and services to more than 1000 energy-related organizations in 40 countries. EPRI’s multidisciplinary team of scientists and engineers in environmental sciences, power generation, and delivery and use draws on a worldwide network of technical and business expertise to help solve today’s toughest energy and environmental problems. A collaborative program in Strategic Research and Public Benefit Research, including environmental quality, public health, energy efficiency, renewables, and infrastructure reliability, is complemented by focused programs in business-critical technologies, including proprietary ventures. A wide variety of applications, training, and technical consulting services are available to supplement participants’ in-house capabilities. EPRI has developed over 6000 hardware, software, and information products that can be provided individually. Ranging from advanced power technology to operating and maintenance manuals to environmental assessments, these products are valuable tools a participant can use to enhance its operations or improve its market position.

Bronze Sponsor
ADA-ES

ADA-ES (NASDAQ: ADES) develops and implements proprietary environmental technology and provides specialty chemicals for coal-fired power plants to enhance existing air pollution control equipment while reducing the plants’ operating costs. ADA-ES’ approach to technology development, implementation, and commercialization involves rapidly taking the technology to full-scale and testing and improving the technology under actual power plant operating conditions. ADA-ES has performed 24 full-scale mercury control demonstrations at electrical utility power plants, achieving mercury emission reductions of over 90% on a wide variety of coal types and air pollution control configurations. ADA-ES offers turnkey commercial ACI systems, activated carbon sorbents and mercury emission guarantees to the electric utility industry and recently announced new commercial contracts for systems. The ADA-ES Emission Strategies Division provides project management, engineering, consulting, and measurement services to develop mercury control strategies for power plant fleets.
Past Attendee Information

Organizations in Attendance at Air Quality IV

Energy & Environmental Research Center
Energy Research Center, Lehigh University
EnGe
Environment Canada
Environmental Systems Corporation
EnvirosTech Technologies Corporation
E.ON Engineering
EPCOR
Exa Energy, Inc.
Fluent Inc.
Gas Technology Institute
General Electric Energy and Environmental Research Corporation
Georgia Institute of Technology
GE KYR-Enertech
Great River Energy
Hamon Research-Cottrell
Hitachi Zosen Engineering
Horiba Instruments, Inc.
Idaho National Engineering and Environmental Laboratory
Idemitsu Kosan Company, Ltd.
Illinois Department of Commerce and Economic Opportunity
Institute of Clean Air Companies
Johns Hopkins University
J POWER (Electric Power Development Company, Ltd.)
KEMA Power Generation & Sustainable REX Inc.
Kinetics Inc.
Koma Research Laboratory
Lawrence Berkeley National Laboratory
Lignite Energy Council
Lovelace Respiratory Research Institute
Lucarz Ltd.
MGC Products
Massachusetts Department of Environmental Protection
McNatt and Greene
METCO Environmental
Minnesota Power
Minot Area Development Corporation
M. J. Bradley & Associates
Mobotec USA, Inc.
MSE Technology Applications, Inc.
MSP Corporation
National Institute of Standards and Technology
National Park Service – Shenandoah National Park
National Wildlife Federation
NRC Resources Canada
N.F. Harding & Associates
Nippon Instruments Corporation
NOIBIT Americas Inc
The North American Coal Corporation – The Falkirk Mining Company
North Carolina Department of Environment and Natural Resources
Northeast Generation Services
Ogletorpe Power Corporation
OhioCustex Company
The Ohio State University
Ohio University
Ontario Ministry of the Environment
Ontario Power Generation
Ontario Power Generation, Nanticoke GS
Otter Tail Power Company
Pace University
Pace University – Biological Sciences
PaciCorp
Pierre et Marie Curie University
Platts/McGraw-Hill
Poweorgen UK plc
Powerspan Corporation
P S Analytical Ltd.
Public Service Enterprise Group
Queenslake Resources USA, Inc.
Reaction Engineering International
Rheinbraun Brennstoff GmbH
RJ Lee Group, Inc.
RMB Consulting & Research, Inc.
Robert L. Hershey, P.E.
Rupprecht & Patashnick Co., Inc.
Sandia National Laboratories
Sasol Technology
SCANA Corporation
Science Applications International Corporation
SCR-Tech LLC
Sensor Research and Development Corporation
Separation Technologies, Inc.
Sherwin Alumina, L.P.
Sierra Southwest Cooperative Services, Inc.
Sorbert Technologies Corporation
South Carolina Electric & Gas Company
Southern Company Services
Southern Environmental, Inc.
Southern Research Institute
Spectra Gases, Inc.

State of Michigan
Stone & Webster, A Shaw Group Company
STORM Coalition
Sunflower Electric Power Corporation
Technology Management Associates, Inc.
Tektran, Inc.
Tennessee Valley Authority
Texas A&M University-Kingsville
Thermo Electron Corporation
Tondi Corporation
Troutman Sanders LLP
TU
UnField Engineering, Inc.
United States Gypsum Company
University of Kentucky
Center for Applied Energy Research
University of Kentucky
Cormak, Inc.
Organization for Economic Cooperation and Development
Coppel Energy Systems

AVK Environmental Solutions, LLC
Advanced Technology Systems, Inc.
AID Daily-Argus Media Company
Aloca
Alliant Energy
Amended Silicates, LLC
American Chemical Society
American Electric Power
American Public Power Association
Apogee Scientific, Inc.
ARCA
Arch Coal, Inc.
Argonne National Laboratory
ATG Power Canada, Ltd.
Atmospheric and Environmental Research, Inc.
Atmospheric Research & Analysis, Inc.
Babcock & Wilcox
Babcock Power Environmental, Inc.
Baldwin Inc.
Barr Engineering Company
Basin Electric Power Cooperative
B.C.S., Inc.
BHA Group, Inc.
Black & Veatch
BIP
Brookhaven National Laboratory
Calpine Corporation
CANSER Energy Technology Centre-Ottawa
Carnegie Mellon University
CEEM Holland BV
Central Research Institute of Electric Power Industry
CH2M Hill
Cinergy
Cleco
Codan Development LLC
CONSOL Energy Inc.
Constellation Energy Group
Consumers Energy
Costmetech, Inc.
Crib Reynolds Clean Air Technologies
Dayton Power and Light Company
Desert Research Institute
Donau Carbon Corporation
Duke Energy
Edison Electric Institute
Electric Power Research Institute
ENEL Produzione Ricerca
Enertab

“Clearly the best conference I attend that balances policy and technical discussions.”—Douglas G. McKinney, U.S. Environmental Protection Agency

“Content of the conference is right on target to today’s most pressing Hg and PM issues.”—Dan Battleson, MSE Technology Applications

“A superior conference linking complex technology advances with policy implications.”—Luke Trip, Environment Canada

“Conference gives the ideas for foreign participants concerning environmental policy in the United States, helping them to propose similar solutions in their countries. Gives perfect opportunity to learn about recent developments in analytical and control methods.”—A.G. Chmielewski, Institute of Nuclear Chemistry and Technology – Poland

“Informative, challenging, and controversial material. Cutting-edge, with several options presented. Shows importance of research and development.”—Anna Tilman, STORM Coalition

“Whether you’re a policy maker or a plant engineer, this conference is a “one-stop shop” for air quality-related information.”—Malcolm Boyd, ATCO Power

“Comments from Past Air Quality Attendees

“This conference is by far the best I have attended as a professional. It provided important information to be used in performing my job duties. I look forward to attending this conference in the future. Keep up the good work!”—Daniel Adams, We Energies/Wisconsin Energy Corporation

“The most useful conference that I have attended in many years. Everyone you ever wanted to talk to was there.”—Dave Livengood, Argonne National Laboratory

“The conference is a ‘must attend’ for all researchers, policy makers, and regulators. Far and away the best all around conference with respect to mercury and PM issues.”—Rich Hargis, U.S. Department of Energy

“... A well-rounded, informative program on the science, technology, and policy of some of today’s most pressing air quality issues. . .”—Brian Stage, NiSource Electric

“The scientific information coupled with regulators’ and industries’ perspective was not only good, but is necessary for continual economic growth and maintaining our environment.”—Tim Price, Associated Electric
Technical Directors
If you have any questions regarding the technical content of the conference, please contact one of the individuals listed below:

**Tom Erickson**
Associate Director for Research, EERC, PO Box 9018, Grand Forks, ND 58202-9018, USA, (701) 777-5153, terickson@undeerc.org

**Tom Feeley**
Technology Manager, Environmental and Water Resources, DOE NETL, 626 Cochrans Mill Road, PO Box 10940 MS 922-237C, Pittsburgh, PA 15236-0940, USA, (412) 386-6134, thomas.feeley@netl.doe.gov.

**Leonard Levin**
Technical Leader and Program Manager, Air Toxics Health and Risk Assessment, EPRI, PO Box 10412, Palo Alto, CA 94304, USA, (650) 855-7929, llevin@epri.com

**John Pavlish**
CATM Director/Senior Research Advisor, EERC, PO Box 9018, Grand Forks, ND 58202-9018, (701) 777-5268, USA, jpavlish@undeerc.org

**William Stelz**
EPA Project Officer for CATM, National Center for Environmental Research and Quality Assurance, U.S. Environmental Protection Agency, Washington, DC, 20460, USA, (202) 564-6834, stelz.william@epa.gov

EERC Event Coordinators
If you have any questions or comments about the conference coordination and marketing, please contact one of the individuals listed below:

**Deb Haley**
Senior Event Manager/Associate Director, Marketing, Outreach, and Administrative Resources
(701) 777-3120
dhaley@undeerc.org

**Anne Fiala**
Event Manager/Manager, Administrative Resources and Outreach
(701) 777-3119
afiala@undeerc.org

**LaRae Foerster**
Event Coordinator, Administrative Resources
(701) 777-5246
lfoerster@undeerc.org

**Derek Walters**
Press/Communications Manager
(701) 777-5113
dwalters@undeerc.org

---

We look forward to seeing you at **Air Quality VI!**

**September 24–26, 2007**
**Crystal Gateway Marriott**
**Arlington, VA**
Hotel Floor Plan

First Floor

Arlington Ballroom
Salon IV
Salon III
Salon I

Service Corridor

Grand Ballroom
Salon K
Salon J

Business Center

Second Floor

Crystal Gateway Marriott

Lobby Level

Lee → Jefferson
Jackson → Madison

Fairfax Boardroom
McLean
Manassas
Alexandria
Mt. Vernon