

# **JV TASK 94 – AIR QUALITY V: MERCURY, TRACE ELEMENTS, SO<sub>3</sub>, AND PARTICULATE MATTER CONFERENCE**

Final Report

*(for the period of July 1, 2005, through June 30, 2007)*

*Prepared for:*

AAD Document Control

U.S. Department of Energy  
National Energy Technology Laboratory  
PO Box 10940, MS 921-107  
Pittsburgh, PA 15236-0940

Cooperative Agreement: DE-FC26-98FT40321; EERC Fund 9188  
Performance Monitor: Lynn Brickett

*Prepared by:*

Thomas A. Erickson

Energy & Environmental Research Center  
University of North Dakota  
15 North 23rd Street, Stop 9018  
Grand Forks, ND 58202-9018

## **DISCLAIMER**

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government, nor any agency thereof, nor any of their employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

This report is available to the public from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Road, Springfield, VA 22161; phone orders accepted at (703) 487-4650.

## **ACKNOWLEDGMENT**

This report was prepared with the support of the U.S. Department of Energy (DOE) National Energy Technology Laboratory Cooperative Agreement No. DE-FC26-98FT40321. However, any opinions, findings, conclusions, or recommendations expressed herein are those of the authors(s) and do not necessarily reflect the views of DOE.

## **EERC DISCLAIMER**

**LEGAL NOTICE** This report was prepared by the Energy & Environmental Research Center (EERC), an agency of the University of North Dakota, as an account of work sponsored by the U.S. Department of Energy National Energy Technology Laboratory, the U.S. Environmental Protection Agency through the EERC Center for Air Toxic Metals<sup>®</sup>, and the Electric Power Research Institute. Because of the nature of the work performed, neither the EERC nor any of its employees makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement or recommendation by the EERC.

## **JV TASK 94 – AIR QUALITY V: MERCURY, TRACE ELEMENTS, SO<sub>3</sub>, AND PARTICULATE MATTER CONFERENCE**

### **ABSTRACT**

This final report summarizes the planning, preparation, facilitation and production, and summary of the conference entitled “Air Quality V: Mercury, Trace Elements, SO<sub>3</sub>, and Particulate Matter,” held September 18–21, 2005, in Arlington, Virginia. The goal of the conference was to build on the discussions of the first four Air Quality Conferences, providing further opportunity for leading representatives of industry, government, research institutions, academia, and environmental organizations to discuss the key interrelationships between policy and science shaping near-term regulations and controls and to assist in moving forward on emerging issues that will lead to acceptable programs and policies to protect human health, the environment, and economic growth. The conference was extremely timely, as it was the last large conference prior to publication of the U.S. Environmental Protection Agency’s final regulations for mercury control from coal-fired utilities, and provided a forum to realistically assess the status of mercury controls in relation to the new regulations.

## TABLE OF CONTENTS

EXECUTIVE SUMMARY .....	ii
1.0 BACKGROUND.....	1
2.0 GOALS/OBJECTIVES.....	2
3.0 EXPERIMENTAL – CONFERENCE PLANNING, PREPARATION, FACILITATION, AND PRODUCTION.....	3
3.1 Conference Planning.....	3
3.2 Technical Program Development and Presenter Logistics.....	4
3.3 Conference Mailings/Marketing.....	5
3.4 Conference Proceedings .....	7
4.0 RESULTS AND DISCUSSION .....	7
5.0 CONCLUSIONS.....	7
6.0 REFERENCES.....	8
AQV FINAL CONFERENCE PROGRAM.....	Appendix A

## **JV TASK 94 – AIR QUALITY V: MERCURY, TRACE ELEMENTS, SO<sub>3</sub>, AND PARTICULATE MATTER CONFERENCE**

### **EXECUTIVE SUMMARY**

Through Energy & Environmental Research Center (EERC) programs such as the Center for Air Toxic Metals<sup>®</sup> (CATM<sup>®</sup>), the EERC is positioned globally as one of the leading groups on issues related to mercury and other trace elements associated with fine particles. Drawing on this expertise, the EERC, the U.S. Environmental Protection Agency (EPA) through CATM, the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL), and the Electric Power Research Institute (EPRI) collaboratively organized and sponsored the Air Quality V: Mercury, Trace Elements, SO<sub>3</sub>, and Particulate Matter Conference (AQV) to provide participants with strategic information regarding advances made in the topic areas introduced at four previous Air Quality Conferences, which reviewed the state of science and policy on airborne pollutants, mainly from utility power generation.

The goal of AQV was to provide a forum for leading representatives from industry, government, research institutions, academia, and environmental organizations to discuss key interrelationships between policy and science that are shaping near-term regulations and controls and to further discussion of emerging air quality issues that will lead to acceptable programs and policies to protect human health, the environment, and economic growth. The conference comprised two streams of discussion, one focused on mercury and the other on trace elements and particulate matter, allowing participants to discuss and develop proactive responses to breakthroughs, questions, and concerns regarding these airborne pollutants.

AQV was held September 18–21, 2005, in Arlington, Virginia. The conference built upon the four previous Air Quality Conferences and continued the expanded coverage of control methods, including fundamentals/science, sorbent technologies, and scrub/multipollutant systems that was established with AQIV and added a new session to address SO<sub>3</sub>.

Attendance for the Air Quality V Conference and workshops attracted the highest number of attendees in the event's history, with 445 attendees. Registrants represented 40 states, the District of Columbia, six Canadian provinces, and 19 countries. Attendees represented 210 organizations, with approximately 46% representing industry and utilities, 20% representing research and academia, 18% representing government organizations, and the remaining 16% representing consulting organizations, media, environmental groups, coal suppliers, and equipment vendors. Extremely positive feedback was received from the attendees through the evaluation process; examples include the following:

*“A very thorough presentation of current technologies and ideas for the future, addressing existing and emerging issues. I will definitely attend future conferences.”*

*– Ian Clark, ATCO Power Canada*

*“I enjoyed attending this conference very much and learned a lot about the mercury issue. Certainly, the organization of the conference is so impressive that it makes me wonder how to match such a level of management for future conference that I will organize back in Taiwan.”*  
– Chung-Ming Liu, National Taiwan University, Taipei, Taiwan

*“New information on many research areas and balanced information on other research areas and policy that I did not know.”*  
– Don Martello, DOE NETL

The conference highlighted keynote presentations given by U.S. Senator Byron Dorgan; U.S. Senator Kent Conrad; William Wehrum, Principal Deputy Administrator and Acting Assistant Administrator, Office of Air and Radiation, EPA; and Carl Bauer, Acting Director, DOE NETL. To complete the opening session and lay the groundwork for the technical sessions to follow, a panel of the nation’s top energy experts provided perspectives on the future of combustion and gasification, research needs, and the challenges facing the utility industry in identifying the best options for future power systems. Over 70 presenters participated in the subsequent technical sessions. In addition, a poster session featuring over 50 presentations was also held, and 21 vendors filled the limited exhibit space (the largest exhibit to date in association with this event).

## **JV TASK 94 – AIR QUALITY V: MERCURY, TRACE ELEMENTS, SO<sub>3</sub>, AND PARTICULATE MATTER CONFERENCE**

### **1.0 BACKGROUND**

Human health and the ecosystem are impacted by air quality, including pollutants from factories, vehicles, power plants, and many other sources. While many factors contribute to air pollution and quality, the power sector has been particularly targeted for environmental regulation. At the same time the United States is committed to protecting the environment, the demand for energy continues to grow. The United States holds more than one quarter of the world's coal reserves, and the energy content of the nation's coal resources exceeds that of the world's known recoverable oil. Coal is the workhorse of the nation's electric power industry, supplying more than half the electricity consumed by Americans and serving as the cornerstone of America's central power system. To preserve coal as an economical and vital energy foundation, much has been invested in developing technologies that allow for the use of coal to generate electricity at low cost while meeting environmental regulations.

Legislation regarding air quality issues has been in process for decades, with the original 1970 Clean Air Act and its amendments in 1977 followed by the 1990 Clean Air Act Amendments. Each of those mandated progressive reductions in power plant emissions, and in 2002, the Clear Skies Initiative proposed dramatic reductions in three pollutants emitted from coal-fired power plants – sulfur dioxide (SO<sub>2</sub>), nitrogen oxide (NO<sub>x</sub>), and mercury.

In the absence of Congressional action on the Clear Skies Initiative, the current Administration finalized three regulations in March, 2005: the Clean Air Interstate Rule (CAIR) and the Clean Air Mercury Rule (CAMR, and the Clean Air Visibility Rule). Together, these three rules create a similar program to control air pollution from the power sector and foster investments in newer, cleaner coal technologies. Combined, these rules will significantly expand the Clean Air Act's most innovative and successful program to further reduce emissions from more than 1300 power plants nationwide. To achieve these reductions, utilities will be required to spend nearly \$2.7 billion, \$4.4 billion, and \$6.1 billion annually in 2010, 2015, and 2026, respectively, on cutting-edge pollution abatement technology.

To keep pace with advancing regulations, an enormous amount of research, development, and demonstration has been conducted by government, industry, and the research community, including the Energy & Environmental Research Center (EERC) Center for Air Toxic Metals<sup>®</sup> (CATM<sup>®</sup>) Program.

To address the energy and environmental issues resulting from air quality policy and regulations, in 1998 the EERC proposed a conference to bring together representatives from industry, environmental groups, the research community, and state and federal government for presentation and discussion of the most critical air quality issues facing our nation and the world. The EERC also pursued the main players in those issues for cosponsorship of the conference—the U.S. Environmental Protection Agency (EPA), as the driver behind environmental regulation, and the U.S. Department of Energy (DOE), as the premier force behind technology development.

That initial conference, entitled “Air Quality: Mercury, Trace Elements, and Particulate Matter Conference” was held in December, 1998, and provided a forum in which to review the state of science and policy regarding the pollutants mercury, trace elements, and particulate matter in the environment in relation to their impacts on health and ecosystems, emission prevention and control, measurement methods, and atmospheric reactions and modeling. Representatives from state and federal government, industry, environmental groups, and the research community presented and discussed issues regarding potential health risks, available and developing control technologies, strategies and research needs, and current and pending regulatory policies. The conference was extremely well received, with more than 200 participants in attendance; 38% of attendees were affiliated with industry, 34% with government organizations, and 26% with research and academia.

Follow-on Air Quality conferences were held in 2000, 2002, 2003, and 2005, covering advances in the topic areas introduced at the first Air Quality Conference, and addressing new issues as they have occurred, including the information collection request for mercury at coal-fired power plants, toxic release inventory data, and PM<sub>2.5</sub> supersite selection. Since the first Air Quality Conference was held, the conference has been expanded to two streams and become international in scope. Additional topics have been addressed, including environmental management, indoor/outdoor air quality issues, air quality of urban and rural settings, multipollutant control, mercury management from by-products, and advanced power systems. In addition, Electric Power Research Institute (EPRI) joined as a cosponsor in 2000 for Air Quality II and has continued as a cosponsor for each subsequent Air Quality Conference. In 2003, Air Quality IV added preconference workshops focusing on mercury measurement, transformations, speciation, and control.

The Air Quality V Conference (AQV) took place September 19–21, 2005, in Arlington, Virginia, with preconference workshops taking place on September 18. From the initial Air Quality Conference held in 1998, the event has experienced steady growth in attendance and exhibitor participation. The Air Quality V Conference and workshops attracted the highest number of attendees in the event's 9-year history, with 445 attendees. Registrants represented 40 states, the District of Columbia, six Canadian provinces, and 19 countries.

## **2.0 GOALS/OBJECTIVES**

Many research and development organizations, including the EERC, are striving to develop effective and economical mercury control technologies and predictive mercury speciation models for coal-fired utility boilers. Further discussion through AQV was of significant value regarding technology advancement and whether appropriate technologies are available to meet suggested emission reductions.

The goal of AQV was to bring together individuals from government, industry, environmental groups, and the research community to discuss and resolve critical questions concerning health risks, policy and regulatory actions, transformations and pathways, sampling and measurement of emissions, predictive modeling, and related control technologies. In addition to covering advancements made in the topics addressed at the first four Air Quality Conferences,

AQV was designed to continue expanded coverage of control methods, including fundamentals/science, sorbent technologies, and scrubber/multipollutant systems, and added a new session to address SO<sub>3</sub>.

Through presentations, poster sessions, panel discussions, and networking opportunities, the conference brought together technical experts and policy makers in a forum that provided discussions contributing to the formulation of environmental policy founded on sound science.

### **3.0 EXPERIMENTAL – CONFERENCE PLANNING, PREPARATION, FACILITATION, AND PRODUCTION**

#### **3.1 Conference Planning**

Planning for the Air Quality V Conference was initiated in July 2004, with confirmation of conference location, dates, and format. During the initial planning meeting, discussions were held regarding a call for abstracts, the conference theme, sponsorship, and the conference format. It was determined that the two-stream format utilized previously would continue to be most effective and that another opening session panel would be worthwhile.

In discussions regarding format, it was decided that the conference should continue with the enhancement of including five preliminary workshops focusing on mercury sampling and measurement, mercury transformation and speciation, mercury control and modeling, and fine particulate and SO<sub>3</sub> issues and approaches. It was agreed that the overarching goal of this conference was to further discussions regarding whether appropriate cost-effective technologies are available to meet suggested emission reductions and to disseminate updated information on the topic areas introduced at the previous conferences.

The initial planning meeting was followed up with the establishment of funding, cosponsors, and a time line for the major tasks involved. Cosponsors of the conference received a number of benefits, including the following:

- Input regarding the technical program
- Attendee registration fee waivers (number of waivers dependent on sponsor contribution)
- Organization overview in the conference programs

Conference technical coordinators were determined from each of the sponsoring organizations and included the following:

- Thomas Feeley, Technology Manager, NETL
- William Stelz, EPA Project Manager for CATM, National Center for Environmental Research and Quality Assurance, EPA

- Leonard Levin, Technical Leader and Program Manager, Air Toxics Health and Risk Assessment, EPRI
- Tom Erickson, Associate Director for Research, EERC
- John Pavlish, CATM Director and EERC Senior Research Manager, EERC

The role of the technical coordinator included providing input through a number of conference calls to assist in determining the format of the technical program, providing chair suggestions, and issuing invitations to chairs and speakers as appropriate.

### **3.2 Technical Program Development and Presenter Logistics**

The technical committee decided that the conference would open with a plenary/keynote session to be followed by a panel on emissions control and power systems of the future. The panel provided perspectives on the future of combustion and gasification, research needs, and the challenges facing the utility industry in identifying the best options for future power systems, laying the groundwork for subsequent conference sessions. Following the opening session, the conference split into two streams, each stream consisting of five separate sessions. The session topics included:

- PM Policy, Regulations, and Health Issues
- Mercury Policy and Regulations
- Mercury Health Issues
- SO<sub>3</sub>
- Mercury Measurement
- PM Measurement
- EPA STAR Progress Review: Hg Transport, Transformation, and Fate in the Atmosphere
- Mercury Control
  - Fundamentals/Science
  - Sorbent Technologies
  - Scrub/Multipollutant Systems
- PM Control
- Mercury Transformation, Plume and Atmospheric Reactions, and Modeling
- Mercury and Coal Utilization By-Products
- PM Transport, Atmospheric Chemistry, and Modeling

EERC researchers with expertise in the session areas served as session coordinators. The role of each session coordinator was to serve as the liaison between their session chairs, technical coordinators, facilitators, and speakers. Session coordinator duties included providing an initial suggestion for chairs, which was followed by discussion and approval of suggested chairs or replacement recommendations by the sponsoring organization technical coordinators. Upon receipt of final chair approvals from the technical coordinators, session coordinators issued invitations to session chairs and conducted initial reviews of the 150 abstracts received from the

call for papers pertinent to their session, noting their recommendations regarding acceptance of the abstracts.

Abstract packets were then provided to the session chairs, and conference calls were held between session coordinators and their respective session chairs to discuss the session goal and to make final decisions on the inclusion of abstracts for paper or poster presentation, ensuring that the goal of each session was achieved through the accepted abstracts. On occasion, it was determined that it was necessary to solicit specific speakers to develop a better technical session, and in those cases, one of the session chairs or the session coordinator then solicited speakers as appropriate.

It was determined that the technical program would be enhanced with a poster session. The poster session was held in conjunction with an exhibit social. A limited exhibit space was available, and it was determined that the exhibits should be placed in the break area for maximum exposure. The poster session was held in the same area in conjunction with an evening social, and over 50 posters presentations were included in the session. Many positive comments were received regarding the quality of the poster session and the opportunity to network with colleagues.

The final program is contained in Appendix A and can be accessed at the EERC's Web site, [www.undeerc.org](http://www.undeerc.org), along with a summary of the conference.

### **3.3 Conference Mailings/Marketing**

The initial conference announcement and call for abstracts was distributed in October 2004 to a mailing list of 16,000, with abstracts due February 1, 2005. Copies of the announcement brochure were also delivered to all technical coordinators, session coordinators, and session chairs for their distribution.

A preliminary brochure including all presenter, facility, and registration information was mailed to over 17,000 individuals in June 2005. This brochure was also provided to coordinators for additional distribution.

E-mail updates in the form of an E-newsletter were sent to everyone on the mailing list with an e-mail address in January, July, and August of 2005.

The following Web sites were linked to the EERC's Web site for AQV information:

- DOE
- EPRI
- International Flame Research Foundation
- Environmental News Network
- Newswise
- EPA
- Power Technology
- UniSci (University Science)

- U.S. Senator Byron Dorgan
- U.S. Senator Kent Conrad

The conference was also advertised in the following newsletters, magazines, journals, and Web calendars, running the general conference information in their individual event calendars from early 2004 to September 2005:

Newsletters, Magazines, Journals

- *Alternative Fuel News*
- *Chemical Engineering*
- *Chemical Engineering News*
- *Chemical Engineering Progress*
- *Coal Week*
- *Coal Voice*
- *Coal People Magazine*
- *Coal Magazine*
- *Coal Tech International*
- *Chemical Engineering Progress*
- *Eastern Europe Business Information Center*
- *ECOAL – World Coal Institute*
- *Energy Conference and Symposia*
- *Energy Daily*
- *EVENT LINE*
- *IEA Coal Research Pollution Engineering*
- *Resource Recovery Report*
- *Scientific Information Service, Inc.*
- *Technology Transition Corporation*

Web Calendars

- Combustion Net Calendar of Events
- Electric Light & Power Magazine
- Enviro News Calendar of Events
- Global Next Conferences
- Green Biz
- IEA Coal Research Forthcoming Events
- Lumex
- McIlvane Company
- Mineral Resources Forum
- NewsWise Calendar of Scientific Meetings
- Power Engineering Magazine
- Rupprecht & Patashnick Co. Inc.
- U.S. Department of Energy National Energy Technology Laboratory
- Events sponsored by NETL
- DOE Fossil Energy Calendar of Events
- U.S. Environmental Protection Agency National Center for Environmental Research
- Energy Central's Conference Watch
- Outreach Links.com
- Environmental News Network

In addition, the following news releases were sent out:

- “Air Quality V Conference Will Feature an Outstanding Slate of Presenters” – May 2, 2005
- “Air Quality Workshops Set for September 18 in Arlington, Virginia” – August 30, 2005
- “Panel of Top Energy Experts to Discuss Power Systems of the Future” – September 8, 2005

- “EPA’s William Wehrun Added as Keynote Speaker at Air Quality V Conference” – September 12, 2005

A final conference brochure was provided to conference attendees as part of their registration packet. The final program is contained in Appendix A and can be accessed at the EERC’s Web site, [www.undeerc.org](http://www.undeerc.org), along with a summary of the conference.

### **3.4 Conference Proceedings**

Over 75% of conference attendees requested preliminary conference papers distributed in three-ring binders and provided during registration. A CD-ROM version of conference materials was finalized after the conference and was then distributed to all conference participants.

## **4.0 RESULTS AND DISCUSSION**

Attendance for the Air Quality V Conference and workshops attracted the highest number of attendees in the event’s history, with 445 attendees. Registrants represented 40 states, the District of Columbia, six Canadian provinces, and 19 countries. Attendees represented 210 organizations, with approximately 46% representing industry and utilities, 20% representing research and academia, 18% representing government organizations, and the remaining 16% including consulting organizations, media, environmental groups, coal suppliers, and equipment vendors. Extremely positive feedback was received from the attendees through the evaluation process; examples include the following:

*“A very thorough presentation of current technologies and ideas for the future, addressing existing and emerging issues. I will definitely attend future conferences.”*  
 – Ian Clark, ATCO Power Canada

*“I enjoyed attending this conference very much and learned a lot about the mercury issue. Certainly, the organization of the conference is so impressive that it makes me wonder how to match such a level of management for future conference that I will organize back in Taiwan.”*  
 – Chung-Ming Liu, National Taiwan University, Taipei, Taiwan

*“New information on many research areas and balanced information on other research areas and policy that I did not know.”*  
 – Don Martello, DOE NETL

## **5.0 CONCLUSIONS**

AQV proved a great success in terms of both attendance and feedback from participants. The Air Quality V Conference reestablished its reputation as the world’s premier conference for reviewing the current state of science and policy for mercury, trace elements, and particulate matter in the environment.

Mercury and airborne particulate matter are two air pollutants that continue to receive much attention and be of great concern. Air Quality V reviewed the current state of science and policy on airborne pollutants, mainly from utility power generation, with a focus on mercury and particulate matter emissions. Science, government, and business representatives met, discussed, and developed proactive responses to breakthroughs, questions, and concerns involving air quality. The conference provided a forum for industry, government, and research organizations to collectively discuss the environmental performance of the nation's future energy infrastructure.

The conference highlighted keynote presentations given by U.S. Senator Byron Dorgan; U.S. Senator Kent Conrad; William Wehrum, Principal Deputy Administrator and Acting Assistant Administrator, Office of Air and Radiation, EPA; and Carl Bauer, Acting Director, DOE NETL. To complete the opening session and lay the groundwork for the technical sessions to follow, a panel of the nation's top energy experts provided perspectives on the future of combustion and gasification, research needs, and the challenges facing the utility industry in identifying the best options for future power systems. Over 70 presenters participated in the subsequent technical sessions. In addition, a poster session featuring over 50 presentations was also held, and 21 vendors filled the limited exhibit space (the largest exhibit to date in association with this event).

The conference was deemed a great success, as supported by the abundance of requests for information regarding the next conference. A summary of AQV is available on the EERC's Web site. Conference proceedings (three-ring binder or CD-ROM) can be obtained by e-mailing Anne Fiala at the EERC at [afiala@undeerc.org](mailto:afiala@undeerc.org).

## **6.0 REFERENCES**

Not applicable.

**APPENDIX A**

**AQV FINAL CONFERENCE PROGRAM**

# FINAL PROGRAM



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.

English is the official language of this conference.

## Technical Program

### Sunday, September 18, 2005

6:30–8:30 p.m. Opening Registration/Exhibit Opening with Appetizers and Cash Bar (**Grand Ballroom**)

### Monday, September 19, 2005

7:30–8:30 a.m. Registration, Exhibits Open, and Continental Breakfast

8:30–10:00 a.m. Opening Plenary Session – **Arlington Ballroom, Salons III and IV**

#### 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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 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. Roeder, 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**
**Stream B**    **Arlington Ballroom, Salon IV**
**Session B1 – SO<sub>3</sub>**
**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 SO<sub>3</sub> 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 SO<sub>3</sub> 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

“Controlling SO<sub>3</sub> in Coal- and Oil-Fired Utility Boilers: Technology and Experience,” Chris Smyrniotis, Vice President, Technology and Market Development, with K. Schulz, Fuel Chemicals, Fuel Tech, Inc., Batavia, IL, USA

“Successful Mitigation of SO<sub>3</sub> by Employing Dry Sorbent Injection of Trona Upstream of the ESP,” John Maziuk, 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

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

**Session B2 – PM Policy, Regulations, and Health Issues**
**Session Coordinator:**

Laura Raymond, Research Manager, EERC, Grand Forks, ND, USA

**Session Chairs:**

Daniel Costa, Chief Pulmonary Toxicology Branch, National Health and Environmental Effect Research Laboratory, EPA, Research Triangle Park, NC, USA

Ron Wyzga, Technical Executive, Air Quality Health and Risk Assessment, EPRI, Palo Alto, CA, USA

**Presenters:**

- “New Developments in Source-Specific Research into the Health Effects of Particulate Matter,” Lucas Neas, Epidemiology and Biomarkers Branch, EPA, Research Triangle Park, NC, USA
- “Assessment of the Health Effects of Coal Combustion Emissions: Preliminary Results from the Teresa Study,” Annette Rohr, Project Manager, Air Quality Health and Risk Assessment, EPRI, Palo Alto, CA, USA; with P. Ruiz, E. Diaz, M. Lemos, B. Gonzalez-Flecha, J. Lawrence, J. Wolfson, S. Ferguson, T. Gupta, C.-M. Kang, J. Godleski, and P. Koutrakis, Harvard School of Public Health, Boston, MA, USA
- “A Review of Recent Epidemiological, Toxicological, and CAPs Studies of the Health Effects of Particulate Matter,” Thomas Grahame, Senior Policy Analyst, DOE, Washington, DC, USA
- “Beyond CAIR: Is There a Need for Further Emissions Reductions?,” Ronald Wyzga, Technical Executive, Air Quality Health and Risk Assessment, EPRI, Palo Alto, CA, USA
- “Air Strategy Assessment Program – A More Effective Tool for Screening Air Quality Impacts of Pollution Controls,” Darryl Weatherhead, Environmental Economist, with B. Hubbell, D. Misenheimer, S. Mazur, and P. Dolwick, Office of Air Quality Planning and Standards; and D. Loughlin, Office of Research and Development, EPA, Research Triangle Park, NC, 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.

Tuesday, September 20, 2005

7:30–8:30 a.m.

Continental Breakfast – Exhibits Open – Grand Ballroom

**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 HgCl<sub>2</sub> 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:**

 “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

 “Pulsed Laser Photolysis – Pulsed Laser Induced  
Fluorescence Studies of the Kinetics and Mechanism of  
the Recombination of Hg<sup>(0)</sup> with Chlorine and Bromine  
Atoms,” Anthony Hynes, Professor, with D. Donohue  
and D. Bauer, Marine and Atmospheric Chemistry,  
Rosenstiel School of Marine and Atmospheric Science,  
University of Miami, Miami, FL, USA

 “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

 “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

10:10 – 10:40 a.m.

Break – Exhibits Open – Grand Ballroom

Tuesday, September 20, 2005 (cont.)

**Session A3 (cont.)**

- 10:40 a.m.** “Preliminary Results from a Mercury and PM<sub>2.5</sub> 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 CO<sub>2</sub> 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

**Session B3 (cont.)**

- “Natural and Anthropogenic Sources of Mercury to the Atmosphere: Global and Regional Contributions,” William Fitzgerald, Board of Trustees Distinguished Professor, with P. Balcom, Department of Marine Sciences, University of Connecticut, Groton, CT, USA; D. Engstrom, St. Croix Watershed Research Station, Science Museum of Minnesota, Marine-on-St. Croix, MN, USA; and C. Lamborg, Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic Institution, Woods Hole, MA, USA
- “Progress Summary: Assessment of Natural Source (Geologic and Vegetation) Mercury Emissions: Speciation, Mechanisms, and Significance,” Mae Sexauer Gustin, Associate Professor, with D. Johnson, P. Weisberg, J. Ericksen, M. Engle, L. Fay, T. Giglioli, S. Lyman, and M. Xin, Department of Natural Resources and Environmental Sciences, University of Nevada-Reno, Reno, NV, USA; J. Rytuba, U.S. Geological Survey; S. Lindberg, University of Tennessee, Knoxville, TN, USA; and H. Zhang and T. Kuiken, Tennessee Technological University, Cookeville, TN, USA
- “Mercury Isotopes as Tracers,” Leroy Odom, Professor, with S. Ghosh and Y. Xu, Department of Geological Sciences, Florida State University and National High Magnetic Field Laboratory, Tallahassee, FL, USA

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 Budget 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.)**
**Presenters:**

- 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, Cormetech, 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 R. Valente, Tennessee Valley Authority, Muscle Shoals, AL, USA

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

- 4:05 p.m.** “Speciated Atmospheric Mercury Measurements in Birmingham, AL, and Near Pensacola, FL,” 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
- 4:30 p.m.** “Mercury Global Mass Balance: Emerging Understanding,” Leonard Levin, Technical Leader, EPRI, Palo Alto, CA, USA; with C. Seigneur, Atmospheric and Environmental Research, Inc., San Ramon, CA, USA; C. Whipple, Environ Corporation, Emeryville, CA, USA; and M. Sexauer Gustin, University of Nevada-Reno, Reno, NV, USA

**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
- “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
- “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
- “Investigations of Particulate Emissions in Coal-Fired Power Plants under Biomass Cofiring,” Mariusz Cieplik, Research Scientist, with R. Korbee and J. Kiel, Energy Research Centre of the Netherlands, ECN Biomass, Petten, The Netherlands
- “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

“Operating Experience with an *Advanced Hybrid*<sup>™</sup> 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

“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, Etaa 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



“Combustion Tuning for Combined Mercury and NO<sub>x</sub> Control at Alabama Electric Cooperative’s Lowman Station,” Sheila Glesmann, Director, with P. Brignac, C. Lindsey, and R. Svendsen, ADA-ES, Inc., Littleton, CO, USA; H. Ott, B. Pansing, L. Spann, and D. Dorman, Alabama Electric Cooperative, Inc, Andalusia, AL, USA; S. Johnson, Quinapoxet Solutions, Windham, NC, USA; and T. Fuller and J. Piboontum, The Babcock & Wilcox Company, Barberton, OH, USA

“Multipollutant Process Combining Cansolv® Regenerable DeSO<sub>x</sub> Process with DeNO<sub>x</sub> Process and an Aqueous Solvent Elemental Mercury Capture Stage,” Leo Hakka, Chief Technology Officer, with K. Stephenne and J. Sarlis, Cansolv Technologies, Inc., Montreal, QC, Canada

“TOXECON II™ Retrofit for Mercury and Multipollutant Control,” Mike Nemergut, Thermo Electron Corporation, Franklin, MA, USA; and Richard Johnson, Principal Engineer, We Energies, Milwaukee, WI, USA; with J. Bustard, S. Sjostrom, R. Schlager, and D. Muggli, ADA-ES, Inc., Littleton, CO, USA; J. Socha and D. Kita, Thermo Electron Corporation, Franklin, MA, USA; T. McMahon, DOE NETL, Morgantown, WV, USA; R. Utter, Cummins and Barnard, Ann Arbor, MI, USA; and R. Chang, EPRI, Palo Alto, CA, USA

“Mercury Behavior in Bench-Scale Furnace with Sorbents,” Daisuke Kamihashira, with N. Fujiwara, Y. Fujita, and K. Tomura, Coal Research Lab, Idemitsu Kosan Company Ltd., Sodegaura, Chiba, Japan; and H. Moritomi and E. Murakami, Graduate School of Engineering, Gifu University, Yanagido, Gifu, Japan

“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,” Cristiana 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 NO<sub>x</sub> 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. Diaz-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 Guldborg 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

“Atmospheric Mercury in the Atlantic Provinces, Canada, from 1995–2004,” Robert Tordon, Atmospheric Chemist, with S. Beauchamp and J. Dalziel, Meteorological Service of Canada, Environment Canada, Dartmouth, Nova Scotia, Canada

“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



“Source-Specific Regional Haze BART Assessments,” Robert Paine, Technical Director, with D. Heinold and R. Iwanchuk, ENSR Corporation, Westford, MA, USA

### Measurement

“Measuring Total and Speciated Mercury in Coal Combustion Flue Gas Solid Sorbent-Based Methods: U.S. EPA 324 and FAMS,” Bob Brunette, MDN HAL Director, with E. Prestbo, L. Hawkins, and G. Van der Jagt, Frontier Geosciences Inc., Seattle WA, USA

“Evaluation of Spike and Recovery Tests to Establish the Accuracy of Hg Speciation Measurements in the Presence of Fly Ash,” Warren Corns, R&D Manager, with P. Stockwell and M. Dexter, PS Analytical Ltd., Orpington, Kent, UK; and D. Fitzgerald and S. Bowden, Mitsui Babcock Technology, Renfrew, Scotland

“Mercury Speciation in Flue Gas Using Dry-Based Conditioning with Atomic Fluorescence Spectrometry,” Warren Corns, R&D Manager, with P. Stockwell and M. Dextern, P S 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 Toxicológicas, 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

“Mercury Speciation in Pulverized Fuel Co-Combustion: Effect of Biomass Share and Air-Staging,” Shishir Sable, AIO, with Ö. Ünal, W. De Jong, Section Energy Technology, Delft University Technology, Delft, The Netherlands; and H. Spliethoff, Institute of Energy System, Technical University of Munich, Garching, Germany

“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

### 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

### Transport, Atmospheric Chemistry, and Modeling

“Interdependence Between the Emission and Imission in the Atmosphere with Reference to Fine Particles PM<sub>2.5</sub>,” 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

Wednesday, September 21, 2005

7:00–8:00 a.m.

**Continental Breakfast – Grand Ballroom Foyer**
**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. Scheffknecht, 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. Gutberlet, 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. Mibeck, 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:**

“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

“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

“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.)

**Session A5 (B) – Control: Sorbent Technologies**

**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:**

Lynn Brickett, Project Manager, DOE NETL, Pittsburgh, PA, USA

Ramsay Chang, Manager, Integrated Environmental Controls, EPRI, Palo Alto, CA, USA

**Presenters:**

**9:20 a.m.** “An Update on the U.S. Department of Energy’s Phase II Mercury Control Technology Field Testing Program,” Thomas Feeley, III, Technology Manager, 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

**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. Slye and T. Ley, Apogee-Scientific, Denver, CO, USA; and L. Brickett, DOE NETL, Pittsburgh, PA, USA

**10:10–10:40 a.m.** **Break – Grand Ballroom Foyer**

**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

**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

**Session B5 (cont.)**

“Distribution of Mercury in FGD Materials,” Candace Kairies, Research Assistant, with K. Schroeder and C. Cardone, DOE NETL, Pittsburgh, PA, USA

“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

**Session B6 – PM Measurement**

**Session Coordinator and Chair:**

Grant Dunham, Research Manager, EERC, Grand Forks, ND, USA

**Presenters:**

“New Precise, Accurate, and Verifiable Metals Measurement System,” John Cooper, President, with B. Johnsen, D. Barth, P. Ginochio, M. Nakanishi, K. Petterson, C. Yanca, 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

“Characterization of PM<sub>2.5</sub> 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

Wednesday, September 21, 2005 (cont.)

 11:30 a.m.–12:30 p.m. **Lunch and Luncheon Remarks – Arlington Ballroom, Salon IV**
**Leonard Levin, Technical Leader and Program Manager, Electric Power Research Institute**
**Session A5 (B) (cont.)**

- 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. Ericksen, 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. McBee, Georgia Power Plant Yates, Newnan, 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 Aljoe, 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
- “Testing Experience with Methods for SO<sub>2</sub> and Particulate Measurement,” Robert Snyder, Advisory Engineer – Environmental Technology, with B. Jankura, The Babcock & Wilcox Company, Barberton, OH, USA; with J. McKenna, ETS, Inc., Roanoke, VA, 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 SO<sub>2</sub> Measurements,” John Ondov, Professor, with S.S. Park and J.P. Pancras, Department of Chemistry and Biochemistry, University of Maryland, College Park, MD, USA
- “PM<sub>2.5</sub> 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. Peld Szus, Degussa Corporation, Parsippany, NJ, USA; R. Rhudy, EPRI, Palo Alto, CA, USA; and C. Miller and S. Pletcher, DOE NETL, Morgantown, WV, USA

**4:20 p.m.**

“Mercury Emissions from Coal-Fired Facilities with SCR-FGD Systems,” James Locke, Engineer, with J. Withum and S. Tseng, Research & Development, CONSOL Energy Inc., South Park, PA, 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

“The Nature of ‘Natural’ Visibility,” Stephen Mueller, Projects Manager and Environmental Research Scientist, and S. Smith, 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. Carmichel and D. Streets, Department of Chemical & Biochemical Engineering, The University of Iowa, Iowa City, IA, USA

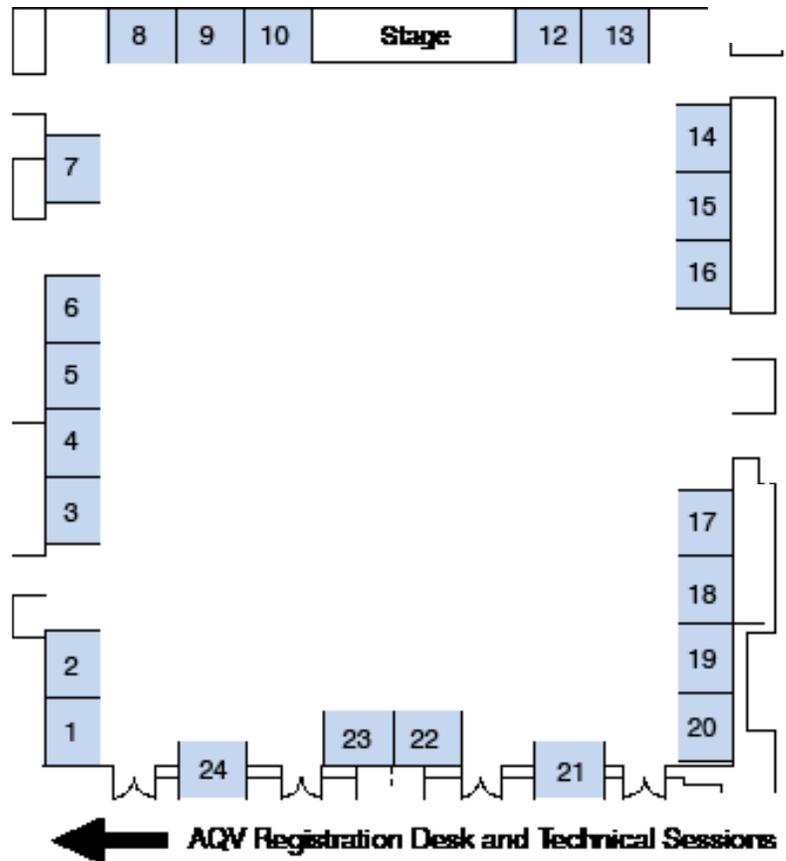
“Evaluating the Relative Effectiveness of Ozone Precursor Controls: Design of Computer Experiments Applied to the Comprehensive Air Quality Method with Extensions (CAMX),” Bryan Hubbell, Environmental Economist, Office of Air and Radiation, with P. Dolwick, EPA, Research Triangle Park, NC, USA; and D.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

# Exhibit Schedule

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

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.
12. Electric Power Research Institute
13. Arizona Instrument, LLC
14. Clean Air Engineering
15. O'Brien & Gere
16. P S Analytical
17. Horiba Instruments, Inc.
18. Sorbent Technologies Corporation
19. Sorbent Technologies Corporation
20. SICK MAIHAK, Inc.
21. METCO
22. EERC
23. EERC
24. 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.

### CATM®

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-fueled power plants to enhance existing air pollution control equipment. ADA-ES has been at the forefront of mercury control for coal-fired boilers since the early 1990s. In 2000, DOE chose ADA-ES to conduct the first four full-scale demonstrations of activated carbon injection (ACI) on coal-fired-power plants. Since then, ADA-ES has been involved in over 20 full-scale mercury control demonstrations at power plants achieving mercury emissions reductions of over 90% on a wide variety of coal types and air pollution control configurations. ADA-ES offers turnkey commercial ACI systems and activated carbon sorbents with emission guarantees and recently announced two new commercial contracts. The ADA-ES Emission Strategies Division provides engineering, consulting, and measurement services to help utility customers develop mercury control strategies for their power plant fleets.

# Past Attendee Information

## Organizations in Attendance at Air Quality IV

ADA-Environmental Solutions, LLC  
 Advanced Technology Systems, Inc.  
 AIR Daily-Argus Media Company  
 Alcoa  
 Alliant Energy  
 Amended Silicates, LLC  
 American Chemical Society  
 American Electric Power  
 American Public Power Association  
 Apogee Scientific, Inc.  
 ARCADIS  
 Arch Coal, Inc.  
 Argonne National Laboratory  
 ATCO 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  
 BP  
 Brookhaven National Laboratory  
 Calpine Corporation  
 CANMET Energy Technology Centre-Ottawa  
 Carnegie Mellon University  
 CDEM Holland BV  
 Central Research Institute of Electric Power Industry  
 CH2M Hill  
 Cinergy  
 Cleco  
 Codan Development LLC  
 CONSOL Energy Inc.  
 Constellation Energy Group  
 Consumers Energy  
 Cornetech, Inc.  
 Croll-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  
 Enerfab

Energy & Environmental Research Center  
 Energy Research Center, Lehigh University  
 Entergy  
 Environment Canada  
 Environmental Systems Corporation  
 EnviroScrub Technologies Corporation  
 E.ON Engineering  
 EPCOR  
 Etas Energy, Inc.  
 Fluent Inc.  
 Gas Technology Institute  
 General Electric Energy and Environmental Research Corporation  
 Georgia Institute of Technology  
 GE KVB-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 & Sustainables  
 KFX Inc.  
 Kinectrics Inc.  
 Komae Research Laboratory  
 Lawrence Berkeley National Laboratory  
 Lignite Energy Council  
 Lovelace Respiratory Research Institute  
 Luscar Ltd.  
 M&C 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  
 Natural Resources Canada  
 N.F. Harding & Associates  
 Nippon Instruments Corporation  
 NORIT Americas Inc.  
 The North American Coal Corporation - The Falkirk Mining Company  
 North Carolina Department of Environment and Natural Resources  
 Northeast Generation Services  
 Oglethorpe Power Corporation  
 OhioLumex 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  
 PacifiCorp  
 Pierre et Marie Curie University  
 Platts/McGraw-Hill  
 POWER Magazine, McGraw-Hill, Inc.  
 Powergen UK plc  
 Powerspan Corporation  
 P S Analytical Ltd.  
 Public Service Enterprise Group  
 Queenstake 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.  
 Sorbent 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.  
 Tekran, Inc.  
 Tennessee Valley Authority  
 Texas A&M University-Kingsville  
 Thermo Electron Corporation  
 Tondu Corporation  
 Troutman Sanders LLP  
 TXU  
 UniField Engineering, Inc.  
 United States Gypsum Company  
 University of Kentucky  
 Center for Applied Energy Research  
 University of Kentucky  
 Consortium for Fossil Fuel Science  
 University of Maryland Center for Environmental Science  
 Chesapeake Biological Laboratory  
 University of North Dakota  
 University of Stuttgart - Germany  
 University of Utah  
 URG Corporation  
 URS Corporation  
 U.S. Department of Commerce National Oceanic and Atmospheric Administration  
 U.S. Department of Energy  
 U.S. Department of Energy National Energy Technology Laboratory  
 U.S. Environmental Protection Agency  
 U.S. Geological Survey  
 U.S. House of Representatives  
 U.S. Senate  
 U.S. Senate Committee on Environment and Public Works  
 Utah Geological Survey  
 Virginia Polytechnic Institute and State University - Alexandria Research Institute  
 Vosteen Consulting GmbH  
 Western Kentucky University  
 Weston Solutions, Inc.  
 West Virginia University  
 Wind River Environmental Group, LLC  
 Wisconsin Energy Corporation  
 W.L. Gore & Associates, Ltd.  
 Xcel Energy

## Comments from Past Air Quality Attendees

**"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<sub>2.5</sub> 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

**"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<sub>2.5</sub> 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

**"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](mailto: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](mailto: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](mailto: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](mailto: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](mailto: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:

**Program Management/Sponsorship****Deb Haley**

Senior Event Manager/Associate Director, Marketing, Outreach, and Administrative Resources  
(701) 777-3120  
[dhaley@undeerc.org](mailto:dhaley@undeerc.org)

**Technical Program/Presenter Information****Anne Fiala**

Event Manager/Manager, Administrative Resources and Outreach  
(701) 777-3119  
[afiala@undeerc.org](mailto:afiala@undeerc.org)

**Exhibitor/Registration Information****LaRae Foerster**

Event Coordinator, Administrative Resources  
(701) 777-5246  
[lfoerster@undeerc.org](mailto:lfoerster@undeerc.org)

**Press Information/Web Site****Derek Walters**

Press/Communications Manager  
(701) 777-5113  
[dwalters@undeerc.org](mailto:dwalters@undeerc.org)

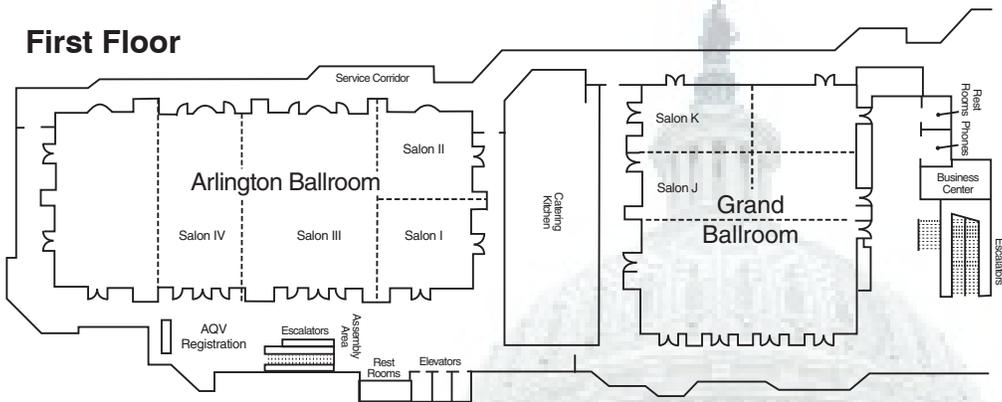
# We look forward to seeing you at Air Quality VI!

September 24–26, 2007  
Crystal Gateway Marriott  
Arlington, VA

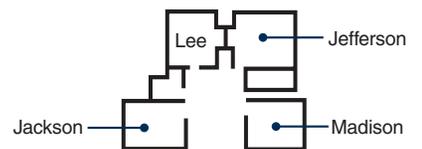


## Hotel Floor Plan

### First Floor



### Lobby Level



### Second Floor

