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16th Annual
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*ESP, Fabric Filters, Scrubbers,
SO₃ and Mercury*

2009
Show Guide

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Electrostatic Precipitators
Fabric Filters
Wet Scrubbers
Cyclones
Flue Gas Conditioning Systems

Ash Handling

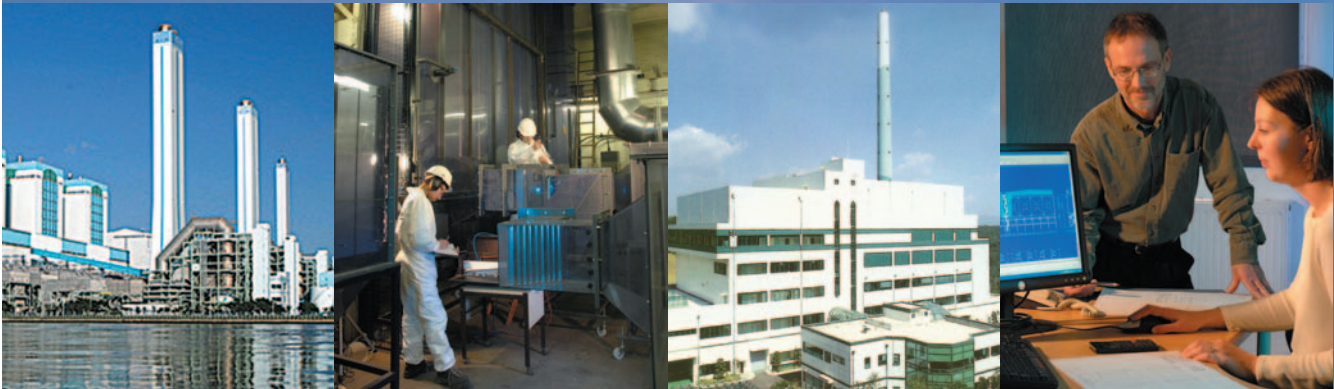
Fly Ash (Pressure, Vacuum Type)
Bottom Ash (SDCC, T-DAC)

Flue Gas Treatment

Flue Gas Desulphurization Systems
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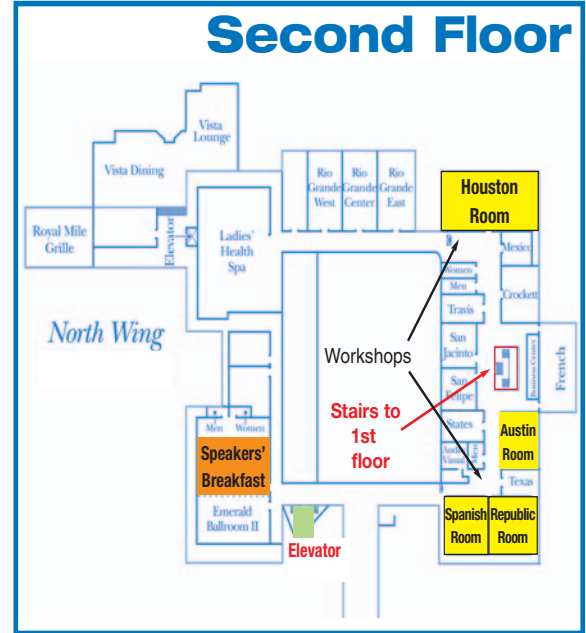
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Woodlands Resort Layout



Key

- Expo Halls
- Workshop Rooms
- WPCA Sunday Seminars
- General Session
- Speakers' Breakfast
- RE Registration Table
- Pool Party

Workshops and Panels

Monday, July 13

8:00-9:30 am

Welcome and Keynote Speech: Presentation of Round Table Lifetime Award by Susan Reinhold.
Keynote Speech: "Energy Point of View, The Deciding Issue of Our Times" by Bob Malone, Entergy Vice President, Technical Services (**Lakeside Room**) Bob will outline the issues associated with Climate Change and Entergy's Point of View for addressing Climate Change. The speech will end by covering damage to Entergy facilities during the 2005 and 2008 hurricane seasons.

10:30-11:30 am

Workshop 1: "Understanding ESP Controls - Quick Overview" by John Knapik, GE Energy (**Republic Room**) This workshop covers the complete ESP electrical circuit including the SCR, CLR, T/R set, AVC, and their relationship to the precipitator. It is taught by a non-electrical person, assuring that it will be easy to understand and simple to grasp the concepts. Some things covered are: how AVC's work and how to set them up; what is the purpose of a current limiting reactor, can we live without it; troubleshooting by evaluating the electrical readings; how do I know when it is justified to add a T/R set; is this a process problem or a control problem, etc. Knowledge of Boolean Algebra is not a prerequisite.

Workshops and Panels

Monday, July 13 continued

Workshop 2: “Fabric Filter Fundamentals” by Florin Popovici, Evonik Fibres (Spanish Room) This workshop describes the filtration theory and filtration mechanisms associated with the removal of dry particulate matter from a coal fired boiler flue gas stream. It includes the evaluation of different types of filter materials and the selection of the most cost effective filter media in relation to the specific process conditions. Relevant methods for the optimization of the fabric filter plants and improving of the bags performance are analyzed. The presentation addresses the bag filter plant condition monitoring and presents some relevant filter bag failure modes. Case studies and references related to coal fired boiler fabric filter plants around the world are included showing the performance, type of filter media, plant design characteristics, process parameters and particulate emission efficiency.

Panel I: “Coal, Biomass, Co-Firing, Alternative Fuels: Which Way to Go” Chairman: Steve Johnson, Quinopoxset Solutions Panelists: Kevin Davis, REI; David Lowman, Hunton & Williams (Lakeside Room) Renewable Portfolio Standards (RPS) in many states require a certain amount of power production using so-called renewable energy sources, and a Federal RPS may be just around the corner. Though states may disagree on the definition of “renewable”, many power plants are exploring ways to co-fire biomass with coal as near term RPS compliance strategy. Generally biomass is lower in sulfur but higher in moisture than the coal it replaces, but what other emission reductions (NO_x, CO, CO₂) does it offer, and is there any impact on boiler operation? How does coal selection affect different biomass options (and vice versa)? These issues will be explored in a panel discussion.

Workshop 3: “ESP’s in a Mercury Constrained World” by Tim Mallory, Air Advantage (Magnolia Room) Long the workhorse of utility pollution controls, what is the future of the electrostatic precipitator in a world with potentially 90% mercury reduction requirements? Can existing systems be modified to meet these requirements? What would be required? What will happen to the sale of fly ash? These and other items will be discussed during this session.

11:30 am-12:30 pm

Workshop 4: “High Frequency Power Supplies” by Per Ranstad, Alstom Power (Republic Room) This workshop will cover operational aspects, including intermittent energization and rapping of high frequency power supplies.

Workshop 5: “Closed-Loop Measurement and Control of SO₃ Processes” by Cal Lockert, Breen Energy (Spanish Room) This presentation will cover on-line measurement of sulfate condensables (SO₃ and ABS) and subsequent closed-loop control of SO₃ mitigation technology. Field experience with wet and dry sodium, calcium and ammonia based mitigation processes will be discussed.

Panel II: “Dry Scrubber Technology - What is in the Future?” Chairman Tony Licata, Babcock Power Panelists: Paul Farber, Sargent & Lundy; Kevin Redinger, B&W; Howard Fitzgerald, Chemical Lime (Lakeside Room) This panel will discuss the application of WFGD and dry FGD technologies, including one of the newer FGD technologies, circulating dry fluidized bed FGD (CDF). While this technology has been in use for many years, recent developments in CFD have advanced the technology and broadened the scope of its application.

Workshop 6: “Options for Hg Removal for Units with PRB Coal and FFs” by Bryan Jankura, Babcock & Wilcox (Magnolia Room) Reducing a PRB coal plant’s stack mercury emissions can be achieved by several methods depending on the plant configuration and emissions limit. This workshop will present various options where fabric filters are included and their operating costs.

2:00 -3:00 pm

Workshop 7: “The Art of Selecting ESP Electrodes and Rappers” by Bob Mastropietro, Lodge-Cottrell (Republic Room) Electrostatic precipitators have been in service collecting dusts, fly ash, and liquid droplets for about 100 years. They have evolved into a number of different electrode configurations depending on application, country, and supplier. This presentation will discuss the various types of electrodes and rapping systems to clean them.

Workshop 8: “SBS Injection: Recent Operating Experience and Advancements” by Jim Jarvis, URS, and Steven Wells, URS (Spanish Room) This workshop will include an update of “Pre-SCR” operating experience including test results and initial operating experience for the new Pre-SCR application at Duke’s Gibson station. The workshop will also include a discussion of operating experience and maintenance issues associated with liquid reagent injection both upstream and downstream of the air heater.

Panel III: (until 3:30 pm) “Balance of Plant Effects on Pollution Control Equipment Due to System Changes” Chairman: Scott Williams, Duke Energy Panelists: John Caine, SEI; Sam Kumar, B&W; Scott Hinton, WS Hinton & Assoc.; Jerry Presley, Dominion; Nolan Frederick, Entergy (Lakeside Room) There are a number of issues that arise with the installation of new environmental equipment or new fuel supplies that are often not considered. Not addressing these issues can have a negative effect on the availability and reliability of a unit. The purpose of this panel is to attempt to identify these “Balance of Plant” issues that are associated with the installation of new environmental equipment or major fuel changes.

Workshop 9: “RWE’s Experience with Mercury Control in Its Coal-Fired PS” by Juergen Wirling, RWE (Magnolia Room) This workshop will present a description of the mercury emission of the RWE lignite and hard coal fired power plants and the process-related possibilities and limits of emission reduction in power plants. The results obtained in a lignite-fired power plant serve to describe the process-related dependencies in the case of Hg separation using carbon containing sorbents. In this way, the substantial findings and experience gained in Hg reduction will be shared with the attendees. Furthermore, the example of mercury balances is used to explain the mercury flows in a power plant from the input to the emission source (gas and ash discharge) before and after waste gas cleaning.

Workshops and Panels

Monday, July 13 continued

4:00-5:30 pm

Workshop 10: “ESP Troubleshooting” by Russ Ridgeway AEP (Republic Room) This workshop will address ESP troubleshooting based on 25+ years of working with precipitators in a major utility system.

Workshop 11: “Coal Blending and Effect on Backend Equipment” by Tony Widenman, DTE (Spanish Room)

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Workshop 12: “Wet Scrubber O & M (discussion)” by Ron Richard, RE Consulting and Steve Wolsiffer, RE Consulting (Lakeside Room) Two retired utility FGD operators will answer the attendees' questions about the challenges one can face in operating and maintaining an FGD system. They have a total of over 60 years of FGD experience with various lime and limestone FGD systems. They have lived through the challenges of the early FGD systems and have been involved in the construction, operation and maintenance of the newest FGD designs. Bring your questions to this open dialogue session.

Workshop 13: “Status of Sorbents and Sorbent Injection for Mercury Control” by Cameron Martin, ADA-ES and Sharon Sjoström, ADA-ES (Magnolia Room) Powdered activated carbon (PAC) has been the most widely applied commercial technology for mercury control in the United States, representing over 98% of the 55 GW of mercury-specific emissions control equipment currently under contract or installed. While capital costs for the equipment is relatively inexpensive in comparison to other pollution control equipment installed at coal-fired power plants, the operating expense of supplying PAC for the control technology can be significant. In this workshop, the factors influencing the effectiveness of sorbents and sorbent injection will be discussed. Topics will include important flue gas constituents and plant operating parameters, key sorbent characteristics that should be considered when specifying a sorbent, and injection system design features that can maximize the effectiveness of the sorbents.

NASCAR Free Ride Drawing: 6:00 pm at Booths 22/23

Tuesday, July 14

8:00-9:00 am

Workshop 14: “Application, Reliability & Maintenance Issues in Switched Mode Power Supplies” by Royce Warnick, Stock Equipment and Jason Horn, Stock Equipment (Republic Room) This workshop will cover (1) How and why power supplies should be tailored for the application and operating environment (2) Importance of redundancy and fault tolerance in SMPS systems (3) Review of SMPS component life cycle limitations and typical maintenance and (4) Reducing component abuse / failure and the importance of building in safeguards.

Workshop 15: “Testing the Use of Trona for SO₂ Removal” by Connie Senior, Reaction Engineering Int. (Spanish Room) In response to changing SO₂ regulations, a number of removal technologies are being tested at coal-fired utility boilers. Scrubbers might not be cost-effective for smaller units, which might be able to utilize lower-cost solutions, such as sorbent injection. Recently, injection of trona (sodium sesquicarbonate) has been suggested as a low-cost method for achieving moderate levels of SO₂ removal. Trona chemistry in flue gas and implementation of injection systems for SO₂ control will be discussed.

Workshop 16: “SO₃ and Fine Particulate Mitigation” by Sam Kumar, Babcock & Wilcox and Al Moretti, Babcock & Wilcox (Austin Room) Both the fine filterable and condensable SO₃ emissions are coming under increasing scrutiny, and in many states, the laws are more stringent than existing federal standards. While it is increasingly being considered in several existing power plants to replace ESPs or retrofit them with bag filters, more than 70% of existing units still utilize electrostatic precipitators that are in relatively good shape. The installation of SCRs and FGD, and Activated Carbon Injection systems for SO_x and NO_x and mercury control, alter the nature of ash and condensables in the flue gas. In several instances, the attempts to reduce these can directly affect the filterable and condensable emissions. The interplay among all these factors and the impact on fine particulate and SO₃ emissions on existing particulate control equipment will be discussed, along with a view to support the power plant operator when making particulate control equipment upgrade decisions.

Workshop 17: “Wet FGD Upgrades – Needs and Strategies” by Mike Walsh, Marsulex Environmental Technologies (Lakeside Room) Upgrades to existing Wet FGD systems can be required for various reasons, and can be limited in nature or involve major retrofit work. Upgrades for absorbers, reagent preparation islands and gypsum dewatering systems can be motivated by both environmental regulations and plant economics. This workshop will discuss the types and drivers of up-grades, case studies and value considerations.

Workshop 18: “Multi-Pollutant Control Fabric Filter” by Anne Minga, Kuttner (Magnolia Room) The LÜHR FILTER with Reaction Chamber / Recycle Process uses a combination of low differential pressure horizontal filter bags, additional retention time and a conditioning rotor to minimize chemical additive use while continuously meeting MACT level compliance limits. Applications have been successfully able to recycle the activated carbon and other acid gas treatment additives up to 10 times while exceeding 90% control of mercury. Performance results will be discussed in this workshop.

Workshops and Panels

Tuesday, July 14 continued

9:00-10:00 am

Workshop 19: “Mid Frequency Power Supplies” by Paul Ford, Redkoh Industries and Dan Steinhaur, Stein Industries (Republic Room) The performance of power supplies running at 400 Hz will be discussed in this workshop. Although this is not as high a frequency as the 20 kHz plus power supplies available in the marketplace today, there may be some distinct advantages in running at a mid frequency range for a power supply used in precipitator control. The merits in operating at a mid frequency compared to operating at traditional 60 Hz and high frequency 20 kHz plus will be investigated.

Workshop 20: “Hot-to-Cold Side ESP Conversion at Minnesota Power” by Eric Eichler, PECO/FGC and Kris Spenningsby, Minnesota Power (Spanish Room) This workshop gives an overview of the very first ESP rebuild within Minnesota Power's fleet. Marginal 1970's ESP at Taconite Harbor Energy Center Unit #2 was converted from Hot-to-Cold design. ESP performance was enhanced with CFD modeling, HV sectionalization, improved rapping, wide plate spacing with RDE's, high frequency power supplies and dual flue gas conditioning.

Workshop 21: “Long Term Injection of Hydrated Lime Upstream of the APH and Potential Co-benefits” by Curt Biehn, Mississippi Lime; Tony Silva, Babcock & Wilcox; Jeff Wilson, Southern Company (Austin Room) This workshop will review the results from an eight week injection trial of hydrated lime upstream of the APH at a utility using eastern bituminous coal. The operation of the APH during the trial and post-trial equipment assessment will be discussed. Sulfur trioxide reductions prior to the APH will be reviewed, with results presented from both in-line instrumentation and controlled condensate testing. Finally, we will discuss any other co-benefits of pre-APH hydrated lime injection with regard to other acidic gases and/or trace metals. The trial program was conducted by a partnership consisting of Mississippi Lime, Babcock & Wilcox, Southern Company, and the Utility.

Workshop 22: “The Evolution of Wet ESPs” by Ron Triscori, RE Consulting (Lakeside Room) This workshop will trace the development of wet electrostatic precipitators from their beginning in 1907 to today's use in the utility market. The presentation will cover the various designs that have been used over this time and why these changes were made, as well as materials of construction development. One section is devoted to the operating units on power plants in North America as well as what units are expected to come on line over the next few years. This presentation will end with a section on new technologies that may help reduce costs on future projects that may need this technology.

Workshop 23: “ACI in a MACT World” by Brandon Looney, Southern Company (Magnolia Room) This workshop will present a brief description of the differences between the Clean Air Mercury Rule and the upcoming Maximum Achievable Control Technology (MACT) regulation. Included will be a view of possible mercury emission standards and the level of control that will be required for compliance. The ability to achieve compliance with the use of Activated Carbon Injection (ACI) will be discussed through an analysis of publicly available ACI demonstration test data. Where the technology appears to be inadequate in reaching possible emission limits, limiting factors will be discussed as well as possible solutions.

Treasure Hunt Drawing: 10:30 am in the Grand Ballroom

11:00 am - Noon

Workshop 24: “FRP and ZLD for the Power Industry” by Pete Honeycutt, & Clint Davison, Kiewit Power Engineers (Republic Room) Pete Honeycutt will address “FRP in the Power Industry: Past, Present and Future.” There has been a tremendous increase in the use of FRP for containment of corrosive materials while scrubbing power boiler gases. FRP is certainly now considered as an engineering material of choice. It has superior corrosion resistance and is the most cost effective alternative of the materials considered. Clint Davison will discuss “FGD Wastewater Treatment with Zero Liquid Discharge Technology.” Zero liquid discharge (ZLD) systems may be required by environmental regulators for existing power plants using wet flue gas desulfurization (FGD) technology because discharge options for waste stream disposal may be limited in the future. The use of ZLD technology to treat FGD wastewater is somewhat new and has mainly been used to treat cooling tower blowdown. ZLD may be an option in the future for existing and new wet FGD systems.

Workshop 25: “Advance Controls for Baghouse Performance Improvements” by Nick Macsata, Alstom Power (Spanish Room) This workshop will discuss baghouse performance improvements through modulated pulse-cleaning with advance control technology.

Workshop 26: “Sodium Sorbents in Dry Injection Systems for Control of SO₂ and SO₃” by Michael D. Wood, SOLVAir Products and Michael Atwell, SOLVAir Products (Austin Room) This workshop will review the use of sodium sorbents, trona and sodium bicarbonate, for control of SO₂ and SO₃ and the impact on the operating plant. A brief overview of the state of the art and design considerations will be discussed. Concerns from supply, delivery, storage, handling, impact on fly ash, efficacy and operational questions such as build up in the system will be addressed.

Workshop 27: “Overview of CFB Scrubber Technology and Comparisons to SDA Technology” by Paul Petty, Allied Environmental (Lakeside Room) This workshop will provide an overview of modern CFB Scrubber technologies and comparisons between key features of CFB Scrubbers and traditional Spray Dryer Absorber (SDA) systems.

Workshop 28: “Emission Implications of Firing Biomass” by Rich Abrams, Babcock Power (Magnolia Room) The use of biomass for power generation is being widely evaluated and implemented across the U.S. It can be used to co-fire with other fuels, as conversions of older coal-fired boilers, to utilize 100% biomass, or in new biomass boilers. The constituents from the combustion of biomass will affect existing air pollution control systems and care has to be used when considering the use of these fuels. This workshop will cover the pollutants generated from the combustion of biomass and the implications of using biomass materials.

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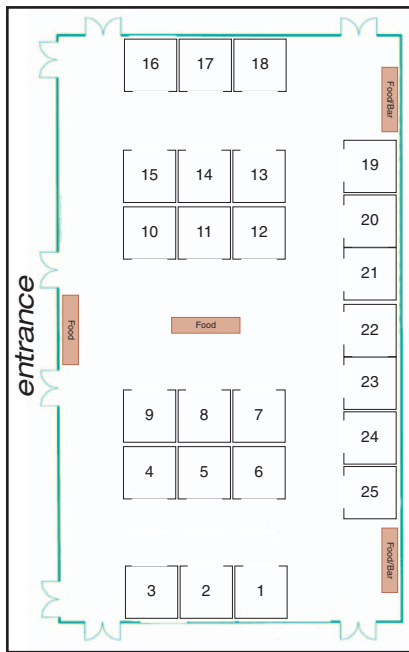
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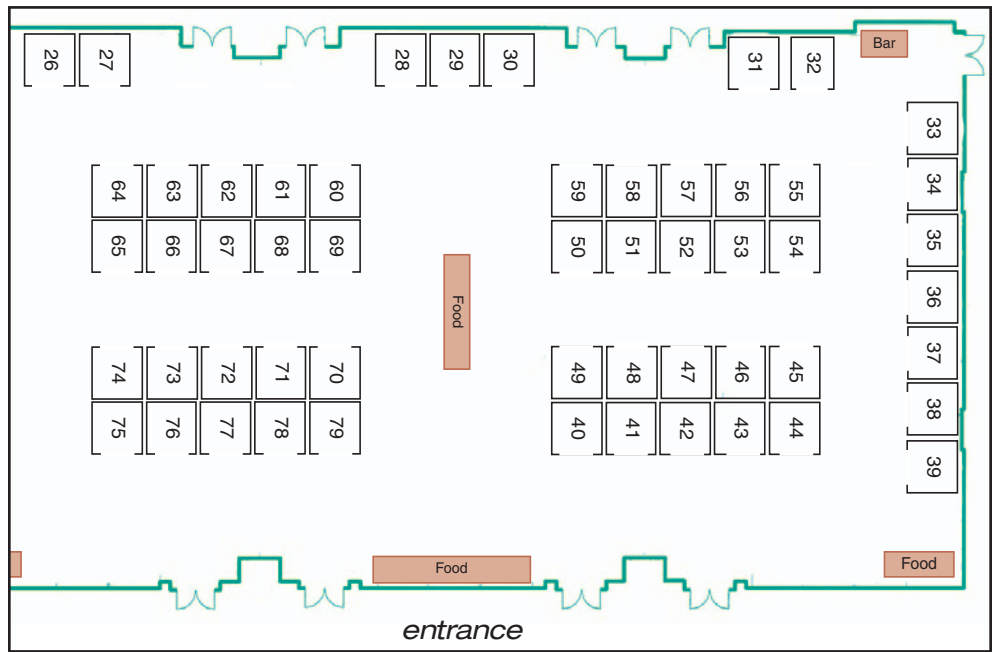
2009 Exhibition Layout

Woodlands Ballroom



The Woodlands Ballroom consists of booths 1 to 25 and is located in the South Wing of the Main Floor of the Woodlands Resort.

Grand Ballroom



The Grand Ballroom consists of booths 26 to 79 and is located in the North Wing of the Main Floor of the Woodlands Resort.

See page 2 for a complete hotel layout.

2009 APC Exhibitors

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Calgon Carbon Corp., see page 13

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EPSCO International, Inc. is a consulting firm specializing in economically solving air pollution control problems for coal-fired utilities, cement plants, and pulp & paper. They promote a 3-Phase approach to defining a problem before trying to solve it: Online Assessment, Offline Assessment, Analyses & Recommendations. EPSCO's staff of 20 consultants and associates have 20+ years of consulting experience on ESPs, FFs, FGD O & M, flue gas conditioning, Mercury control, and SCR Maintenance & Structural Rehab on 300+ successful projects.

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Siemens is a world leader in the design and supply of air pollution control systems and services for industrial and utility power generation facilities. Technologies include wet or dry FGD systems, fabric filters, wet or dry electrostatic precipitators, and mercury control technology. Aftermarket Services offers technical support, training, rebuild/ upgrade services and replacement parts.

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Richard Blanchard, Sales Manager

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P.O. Box 201088

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