

**The ASHRAE Rocky Mountain Chapter &
Denver Chapter IAQA Present:
The 18th Annual
Technical Conference:**

**Sustaining Our Future by
Rebuilding Our Past**



Friday April 16th, 2010

Register and Pay at www.rockymtnashrae.com

Sheraton Denver West Hotel

360 Union Boulevard

Lakewood, CO 80228



This year's Technical Conference theme is "Sustaining Our Future by Rebuilding Our Past". Our Keynote Speaker will be Lynn Bellenger, P.E., Fellow ASHRAE and the current President-Elect for ASHRAE at the Society Level. Lynn will be discussing ASHRAE Standard 189.1, The Advanced Energy Design Guides, Net Zero Energy Buildings and the future direction of ASHRAE. As green buildings and green methods become more common place there are great opportunities to renovate and retrofit existing buildings to use less energy and still maintain a comfortable interior environment. This year's conference will include the Fundamentals Track, Systems and Applications Track (formerly the Advanced Track), the Sustainability Track (formerly the Green Guide), the Building Automation Track, and this year an Indoor Air Quality Track.

This year the ASHRAE Denver Chapter is co-sponsoring this event with the Indoor Air Quality Association. The Indoor Air Quality Association (IAQA) is an international association headquartered within the Washington, DC metropolitan area, in Rockville, Maryland. It was established in 1995 to promote uniform standards, procedures and protocols in the Indoor Air Quality industry. IAQA is a non-profit, 501(c)(6) organization. Membership is open to anyone with an interest in IAQ. Current members come from a diverse range of professions and trades including Environmental Consultants, HVAC Practitioners, Design Engineers, Restorers and Remediators, Industrial Hygienists, Building & Facilities Managers, Attorneys, Manufacturers Reps and many others in related fields. IAQA provides training classes for workers, techs and supervisor/managers on microbial remediation and investigation as well as advanced classes for IAQ consultants and specialists. Many courses correspond to the knowledgebase and core skills defined by ACAC Council-certified programs. Finally, IAQA co-funds research into a wide variety of issues including human performance and IAQ, and mold remediation. New projects are under regular consideration.

Thank-you:

This event has been ongoing for a number of years thanks to the efforts of many dedicated individuals that contribute their time by serving on the conference committee. The Rocky Mountain Chapter would therefore like to express its gratitude to these individuals and their respective companies.

Technical Conference Committee:

Jon Rundquist – Johnson Controls Committee Co-Chair	Cay Strother – Denver Water
Ken Urbanek – MKK Consulting Engineers Co-Chair	Tom Mieczkowski – Kaiser Permanente
Brian Lynch – Western Mechanical Solutions	Mark Labac – Edge Mechanical Systems
Mike Fulton - Western Mechanical Solutions	Steve Dexter – Air Filter Solutions
David Rodenberg- LONG Building Environments	Steve Carver – CFM Company
Greg Bradshaw- Bradshaw Building Solutions	Justin Dunkin – CFM Company
Ira Goldschmidt – Goldschmidt Engineering	Michelle Swanson – RMH Group
Dave Kahn – The RMH Group	Adam Bishop – CFM Company
Bill Mele – Indoor Environmental Solutions	Trevor Bromberg – McGrath, Inc.
Mike Harrington – Setpoint Systems	Larry Gelin – CFM Company
Ken Nekvasil – FHS Controls	Megan Van Wieren – EMC Engineers

We would also like to thank all of our sponsors for this event. Sponsor names will be listed on signage at the conference. Without their support, this conference would not be possible.

Thank you,

Jon Rundquist, Committee Chair

“Sustaining Our Future by Rebuilding Our Past”

For Whom:

Presentations for entry level and senior level engineers, architects, designers, students, salespersons, manufacturers, contractors, building officials, building owners, and building managers and operators.

When:

Friday, April 16, 2010

Your Cost:

(Early registration before April 4th)

½ day: \$ 125 (lunch included)

Full day: \$ 175 (lunch included)

Cost for late registration after April 4th

½ day: \$ 135 (lunch included)

Full day: \$ 185 (lunch included)

(10% discount to companies sending 5 or more)

Professional Development Hours (PDH):

A form will be available at the registration desk to document your participation in the Technical Conference, which assigns the appropriate PDHs to each session.

7:30 - 8:00: Check-In / Registration

Luncheon Keynote Address:

Sponsored by: Western Mechanical Solutions

ASHRAE, Standard 189.1, the Advanced Energy Design Guides, Net Zero Energy Buildings, and Future ASHRAE Directions

ASHRAE Standard 189.1, Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings, has recently been published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), in conjunction with the Illuminating Engineering Society (IES) and the U.S. Green Building Council (USGBC). Standard 189.1 is the first code-intended commercial green building standard in the United States. The standard provides a long-needed green building foundation for those who strive to design, build and operate green buildings. From site location to energy use to recycling, this standard will set the foundation for green buildings through its adoption into local codes. It covers key topic areas similar to green building rating systems: site sustainability, water use efficiency, energy efficiency, indoor environmental quality and the building's impact on the atmosphere, materials and resources. **The ASHRAE Advanced Energy Design Guides (AEDG)** is a series of publications designed to provide recommendations for achieving energy savings over the minimum code requirements of ANSI/ASHRAE/IESNA Standard 90.1-1999. The initial series of guides have an energy savings target of 30% which is the first step in the process toward achieving a **Net Zero Energy Building** - defined as a building that, on an annual basis, draws from outside resources equal or less energy than it provides using on-site renewable energy sources. Each 30% Guide addresses a specific building type. Additional guides for existing buildings and at 50% energy savings towards a net zero energy building are also planned.

Lynn G. Bellenger, P.E., Fellow ASHRAE, a partner with Pathfinder Engineers and Architects, is the current President-Elect for ASHRAE at the society level. Bellenger is a member of the Indoor Air Quality Design Guide Steering Committee, and chairs the Advocacy Committee and Members Council. She formerly served as treasurer and vice president. Bellenger is a recipient of the Exceptional Service Award, the Distinguished Service Award, two first-place ASHRAE Technology

Awards and the Lincoln Bouillon Membership Award.

Rebuilding Our Past”

Track 1 – HVAC Fundamentals

Sponsored by: CFM Company

8:00 – 8:55: Structural Engineering 101

Structural engineering 101 for mechanical engineers will review how your work and equipment selections affect building design, structural systems, IBC provisions, seismic, wind, snow, rain, etc. what structural information is needed from you, coordination and building information modeling

Speaker: Ralph D. Rempel, P.E. is a Principal at Martin/Martin, Inc., Lakewood, CO. Mr. Rempel has been practicing engineering in Colorado since 1981. His work encompasses all aspects of structural engineering with a special expertise in Building Information Modeling and design for progressive collapse/blast resistance. A graduate of the University of Colorado/Boulder, Mr. Rempel is involved in multiple organizations including Structural Engineers Association Colorado; American Institute of Steel Construction; American Society of Civil Engineers/Member of the Standard for Blast Protection of Buildings Committee, and the National Fire Protection Association. Mr. Rempel holds professional engineer licenses in Colorado, six additional states, and two Canadian Provinces. He is a member of Martin/Martin's Structural Department Management Team and recently participated in humanitarian efforts in Haiti, performing evaluation of structures after the Port-au-Prince Earthquake.

9:00 – 9:55: Acoustics and Vibration Control

Building mechanical systems are often the major contributor to the amount of background noise and vibration in a project and can have a dramatic effect on the ability to hear speech and audio programs. The acoustics presentation will be a general overview of acoustical terms, design criteria, and characteristics of sound. Discussion points will include acoustical input on mechanical design concepts, vibration isolation of mechanical equipment, and the effect of LEED requirements on acoustical recommendations for mechanical systems in education projects.

Speaker: Kelly Stumpf is an Associate with Shen Milsom Wilke and earned a Bachelor of Science in Engineering with an emphasis in acoustics from the University of Hartford. She has worked with Shen Milsom Wilke for 6 years in the acoustics department

10:10–11:05: Technologies for Efficiency

Exploration of technologies for improving HVAC systems efficiency and basic calculations to back them up. The application, sizing, and control methods are as important as the technology selected to achieve energy efficiency and high performance. Technologies include variable volume applications, various efficiency boilers, duct and pipe sizing, control strategies, system sizing for efficiency improvement, desiccant dehumidification, ground-source heat pumps, outside air heat exchange, radiant heating and cooling, cooling tower selection, displacement ventilation, outside air strategies, and others. **LEARNING OBJECTIVES:** Improve understanding of HVAC Systems technology selection and design on overall building energy performance. Learn about system decisions that can improve efficiency and emerging HVAC technologies and applications. Think about energy-reduction impacts in terms of global warming mitigation goals.

Speaker: Michael D. Haughey, P.E., HBDP, CEM, LEED AP is the owner of Silvertip Integrated Engineering Consultants. Michael has 36 years of experience in HVAC & Mechanical consulting, facilities engineering, energy analysis, systems commissioning, and sustainability consulting. Past President Rocky Mountain Chapter ASHRAE; CRES Board of Directors, USGBC – Colorado Board of Directors, Education Director, Programs Coordinator; Member AIA Colorado Committee on the Environment, AEE, RMAEE, and the Colorado Earthquake Hazard

Mitigation Council. Lecturer, HVAC Design, CU Boulder; Past instructor, HVAC Design, CU Denver and CU Boulder. Traditional mechanical design experience with specialization in alternative and energy-conserving systems.

1:35 – 2:30: Psychrometrics and Energy Recovery

This session will examine the fundamentals of psychrometrics including most processes that are used in air-to-air energy recovery systems, heat recovery systems and refrigeration systems.

Speakers: Scott Laurila is a Senior Applications Engineer for Greenheck Fan Company and earned a BSME from the University of Wisconsin at Madison. Scott has 5 years of experience at Greenheck Fan Company in make-up air and energy recovery.

2:35 – 3:30: Psychrometrics

Close coordination between electrical and mechanical disciplines seems like a logical strategy in the development of any project. Unfortunately, miscommunication and assumptions can hamper effective coordination and negatively impact the project. This presentation will outline key areas to concentrate on to help maximize coordination efficiency and increase mechanical design performance.

Speaker: Wes McKinney, P.E. has more than 20 years of experience providing electrical engineering services from conceptual design through startup for institutional, commercial, and industrial projects, including those with construction budgets well over \$100 million. His areas of expertise include high-reliability systems, large power systems, and electrical power generation and cogeneration. A graduate of the University of Illinois, Urbana-Champaign, he is a registered professional engineer in Colorado and nine other states. He is involved in several industry organizations including 7X24 Exchange, the American Council of Engineering Companies, and the National Council of Examiners for Engineering and Surveying. As a division manager at The RMH Group, he is responsible for team performance and has ultimate responsibility to see that end client expectations for project schedule, budget, and quality are met.

3:35 – 4:30: Variable Frequency Drives

Successful VFD installations require forethought to avoid problems in key areas, ranging from applications, installation issues, harmonics & EMI/RFI and motor-drive compatibility issues. This seminar is for both the beginner and advanced engineer as theory is not the focus, rather practical and applicable rules will be described.

Speaker: Jeff Miller is Vice President Commercial Business at ABB, Inc. He has an Associates degree in Electrical Engineering and a BS in Business Management frp, Cardinal Stritch University. Jeff has 13 years with Danfoss/Graham with positions including Engineering, Service and Sales. 8 years with ABB as a Regional Manager, until he began his position as Vice President of Commercial Business. Jeff has extensive experience with VFD applications including compliance with IEEE519, motor/drive interaction and embedding VFD's into HVAC applications both traditional and new such as geothermal, heat and energy recovery, and fan arrays.

Track 2 – HVAC Systems & Applications

Sponsored by: McNevin Company

8:00 – 8:55: Energy Recovery Methods

This presentation will compare and contrast various energy recovery methods focusing primarily on heat pipe modules – close coupled, split and pumped systems

Speaker: Tom Brooke is president of Heat Pipe Technologies – Gainesville, FL

9:00–9:55: Appendix G, What the F

Energy modeling to Appendix G presents a number of challenges for an engineer, including understanding the details and intricacies of the rating method's requirements, finding solutions for non-typical situations, gathering information, and communicating with the design team. It also has the potential to add great benefit to the design process and result in an energy efficient building design that uses cost-

effective solutions. This presentation will discuss building energy modeling and analysis per ASHRAE 90.1-2007 Appendix G Performance Rating Method from the perspective of an energy modeler, and from that of an HVAC design engineer. You will come away with a deeper understanding of the rating method, and be able to more effectively benefit from integrating the modeling into your design process. We expect to focus somewhat on people's specific questions, so come prepared for some discussion.

Speaker: Aleka Pappas is a building energy engineer at Enermodal Engineering in Denver. She holds degrees in both architecture and engineering, and has been working with building energy efficiency for over 7 years. Aleka currently manages energy design assistance projects at Enermodal, helping design teams to cost-effectively integrate energy efficiency strategies into their designs. She has energy modeling expertise in DOE2/eQuest, CFD, Ecotect, and EnergyPlus.

Scott Martin, PE, LEED AP is a project engineer/manager at The RMH Group and has 17 years of diverse mechanical engineering experience working on institutional and commercial facilities. In addition to design, he has expertise in project management, including coordinating design and construction administration with owners, architects, engineers, and contractors. As the past president he is currently serving as a director on the board of governors for the Rocky Mountain Chapter of ASHRAE.

10:10 – 11:05: Introduction to Chilled Beams

Chilled beam systems are growing in popularity but many engineers have not had any personal design experience with them. Chilled beams have many special design challenges involving air/water temperatures, air dew point, and fresh air. This presentation will discuss different types of chilled beams – passive and active – and introduce how to design these systems.

Speaker: James Murphy is a Sales Engineer at LONG Building Technologies with over 15 years experience in the Colorado HVAC market. He is a mechanical engineering graduate from Vanderbilt University.

1:35 – 2:30: Advanced VFD's Application

Jeff will discuss the more detailed application issues with VFD's. Motor-drive compatibility issues (including running motors to 90Hz, multiple motors fed from one VFD), harmonic compliance (IEEE 519) will be explained in simple terms with easy to follow rules, having your VFD's talk with the building automation system to gain more functionality and energy savings. Jeff will also discuss control strategies for maximum energy savings as well as interact with the attendees to answer their questions. This course is designed to make applying VFD's simple and trouble-free.

Speaker: Jeff Miller is Vice President Commercial Business at ABB, Inc. He has an Associates degree in Electrical Engineering and a BS in Business Management frp, Cardinal Stritch University. Jeff has 13 years with Danfoss/Graham with positions including Engineering, Service and Sales. 8 years with ABB as a Regional Manager, until he began his position as Vice President of Commercial Business. Jeff has extensive experience with VFD applications including compliance with IEEE519, motor/drive interaction and embedding VFD's into HVAC applications both traditional and new such as geothermal, heat and energy recovery, and fan arrays.

2:35 – 3:30: Variable Refrigerant Volume- Designing with Multi-Splits

Variable Refrigerant Volume is a general name for systems that use single condensing units that feed to multiple evaporators/fan coils. These systems transfer energy through the refrigerant loop to all building zones. This presentation will introduce these systems, how they work and what kinds of projects they are most appropriate for. Other design considerations such as cost, efficiency, fresh air and LEED will also be discussed.

Speaker: Corey Bartlett is a design engineer with Daikin AC – Carrollton, TX

3:35 – 4:30: Saving Energy with Fans

Sustainability, LEED certification and green buildings are all hot topics and certainly generating debate among engineers. But, everyone is interested in reducing the impact of high energy costs. And today's marketplace is more interested in high-performance buildings that use less energy. Fans, as a product group, consume significant amounts of a building's energy and revisiting the

principles of fan power can yield energy saving solutions for you and your clients. You will leave this seminar with the insight necessary to incorporate significant power savings in your fan systems at the design stage.

Speaker: Doug Yamashita is Executive Vice President of Sales and Marketing at ACME Engineering and Manufacturing Corp.

Track 3 – Sustainability

Sponsored by: Johnson Controls, Co.

8:00 – 8:55: High Performance Building Rating Systems and Standards

While LEED may be the most common building rating system for commercial buildings, this seminar contrasts other systems used in Colorado with a focus on energy performance requirements, energy analysis, and system selection. Systems and standards include ASHRAE Standard 189, the Colorado Collaborative for High Performance Schools (CO-CHPS), Labs 21 Environmental Performance Criteria, Living Building Challenge, and the 2030 Challenge.

Speakers: Linda Morrison, PE, LEED-AP, CEM is the Building Performance Engineering Team Leader and a Project Manager with Ambient Energy with seventeen years experience in sustainable design, energy analysis, daylight performance, measurement and verification, and facility audits for energy and operational efficiency. Jesse Stanley has a B.S. in Architectural Engineering from the University of Colorado at Boulder specializing in computer simulations and building physics. Jesse has performed energy analyses, CFD analyses, and MEP design on many different building types for both new construction and existing buildings.

9:00–9:55: Net Zero Buildings

Paul will describe some experiences using integrated design to advance design thinking in projects over the last 30 years. While building technology and energy conserving measures have advanced considerably in that time, the fundamentals of teamwork and communication remain largely the same. Although the design “charrette” has become nearly standard practice for many projects, it is not always properly implemented. Paul will share his insights regarding the complex interaction among architects, mechanical engineers, and the rest of the design team.

Utilizing his extensive background implementing and teaching daylighting, Paul will explore the interactions between this fundamental sustainability strategy and HVAC system design. In particular, he will examine the question of whether daylighting truly reduces cooling loads and thereby reduces HVAC energy use.

Speaker: Paul Hutton has devoted his 30 year career in architecture to two primary interests – sustainability and environments for learning. He has learned that the best way to achieve success in our industry is through practicing integrated design, in which the creative thinking of all engineering partners are acknowledged and incorporated. Paul has been an advocate of innovative HVAC systems for many years, beginning with his use of earth cooling tubes in solar houses in the 1970’s and continuing with the wide spread application of displacement ventilation in his school designs since 2004. Paul’s firm, Hutton Architecture Studio, completed Colorado’s first LEED NC Gold public school and is currently assisting the Governor’s Energy Office in management of the state-wide High Performance Building Program.

10:10 – 11:05: Legal Hazards on the Way to Sustainability

This session will discuss the emerging legal and insurance issues that could accompany the trend toward green buildings.

Speaker: Alfred Zarleng, CIC, AAI works in the Professional Liability Department at VGIC. My clientele consists primarily of Architects and Engineers. My focus is to respond to my client’s concerns and provide exceptional service to meet those needs. I assist my clients (and prospects) in maintaining important coverage, help with risk exposures, provide contract review services and educate with loss prevention material.

Phil Cardi is an attorney specializing in the representation of design professionals.

1:35 – 2:30: Integrated Design

The Integrated Design process is an important part of high-performance building design, and can be instrumental to the success of a project.

This seminar discusses the basics of the integrated design process, and compares it to a conventional design process, emphasizing the impact on the role and involvement of the consulting engineer. From this presentation, the designer should be able to answer the question, “How integrated is this design process?” Indicators of a productive integrated design process as well as a ‘dis-integrated’ process will be discussed.

Speaker: Barry Stamp, P.E., LEED AP, and Principal at Shaffer • Baucom Engineering & Consulting has more than 24 years of experience in the mechanical consulting engineering business, including direct project experience with the Integrated Design Process and experience applying sustainable design techniques and standards for LEED® certification. A native of Colorado, Mr. Stamp is a graduate of The University of Colorado at Boulder, where he received his Bachelor of Science Architectural Engineering degree with an emphasis in Building Energy Engineering, Thermodynamics, and Heat Transfer. Additionally, Mr. Stamp is a frequent contributor to Engineered Systems Magazine.

2:35 – 3:30: Continuous Commissioning

Studies show that the median energy savings realized from existing building commissioning is 13% of the whole-building energy use. This savings can be achieved at relatively low cost providing high economic returns for the customer. After commissioning is complete, ongoing monitoring keeps optimized operation in place assuring persistence of savings over time. This session will provide an overview of the existing building commissioning process including the different techniques used for analysis, the most common issues identified, and how these issues can be avoided. Ongoing performance monitoring will also be covered to provide an overview of the potential benefits and challenges to observing operation over time.

Speaker: Celeste Cizik, PE, LEED-AP, CEM, is a Project Manager at EMC Engineers with a wide range of experience in building systems and energy related engineering including retro-commissioning, energy analysis, mechanical system design, energy planning and sustainability consulting. She has led energy audits and retro-commissioning projects for a wide variety of customers and building types across the country. She has participated in many retro-commissioning programs and also led the development of an energy savings calculation tool for Xcel Energy’s RCx program.

3:35 – 4:30: GeoExchange Systems for Retrofit Applications

This presentation will look at GeoExchange Systems in Retrofit Applications. The presentation will discuss the pitfalls and site considerations that need to be examined in order to determine if GeoExchange is viable for a project.

Speaker: Trey Austin, P.E. is owner of Geo-Energy Services. His focus is designing, analyzing, and consulting on a wide variety of GeoExchange systems. He is a Certified GeoExchange Designer and a Certified Energy Manager. Recent projects that Mr. Austin has worked on include two DOE grant funded projects, the Denver Museum Extension project and the State of Colorado Capitol project.

Track 4 – Building Automation

Sponsored by: LONG Building Technologies

8:00 – 8:55: DDC Basics

This presentation discusses the fundamental components and concepts used in modern temperature control systems. Selection and proper installation of field devices, including valves, dampers, temperature and pressure sensors as well as the safety devices will be covered. Basic control concepts, including two position and modulation with PID, will be presented with examples. BAS panel types, operator interfaces and different programming languages will also be covered. The presentation will conclude with an overview of the ASHRAE publications that provide additional information on specifying DDC equipment and developing sequences of operation.

Speaker: Dave Kahn is a project manager with The RMH Group, Inc., with over 20 years experience designing HVAC and control systems for a

wide variety of facilities. He also has 10 years experience as a controls contractor. Dave has served as chair of ASHRAE Technical Committee 1.4, Control Theory and Application, is a member of SGPC 13 "Specifying Direct Digital Control Systems", and is an ICC plans examiner for both the Uniform and International Building Codes.

9:00 – 9:55: Specifying BAS

Specifying BAS's involves not only understanding the technology and products, but also the unique nature of BAS contracting and construction practices. This seminar presents the key issues that an engineer needs to focus on when specifying BAS's given that a controls contractor provides design-build services (even in a bid environment). Guidance on specifying these key details such as the system architecture and protocols, the DDC controller products, the "field devices", installation methods, the sequence of operation and point list, will be provided. The seminar's goal is to provide the knowledge needed to more efficiently provide BAS design services.

Speaker: Ira Goldschmidt, P.E., LEED AP is the owner of Goldschmidt Engineering Solutions, which provides controls, interoperability and intelligent building expertise to the building industry. Ira has over 30 years experience with HVAC design, building automation and energy management. He developed some of the earliest DDC installations for HVAC control, is a co-author of the ASHRAE Guideline for "Specifying Direct Digital Controls" and the BACnet® standard, and is a regular contributor on building automation-related subjects to various industry journals.

10:10 – 11:05: LEED V3 as it Relates to Controls

With the advent of the release of LEED Version 3 there is a need to understand how the application of HVAC controls works in relation to obtaining LEED certification in buildings. This session will cover an in depth analysis of LEED Version 3 and what controls are required, especially in areas such as Water Efficiency, Energy & Atmosphere, Indoor Environmental Quality and Innovation & Design Process.

Speakers: Ken Nekvasil is a Division Manager/Partner for FHS Controls, has 25 years of HVAC controls and equipment experience. He has a broad range of experience in the control of HVAC systems starting out as a field technician. He later worked as a control design engineer before moving into project management. Finally the last several years have been spent as a sales engineer with a specialty in the application of controls in critical systems such as data centers, labs and medical facilities. He is also well versed in the use and application of BACnet based control systems.

1:35 – 2:30: BAS Retrofit for Sustainability

Building Automation Systems (BAS), one of the most important features of any facility, is sometimes less than it should be once the owner "takes possession". In the end, the owner wants a BAS that is provided by one vendor with fair pricing and great service. How do we help the owner achieve those goals? Many times this process can be flawed if the owner is not fully involved from the very beginning in the selection of the BAS and more importantly, its local support group. There are many important factors involved with the BAS that should be reviewed with the owner and his operating staff prior to the BAS design. This seminar will review how to decide, with the owners input, what is really important to them and what choices are available. The subjects will include technology, open or proprietary systems, software, energy, comfort and maintenance concerns, interfaces to other building systems, submittals, commissioning, training and contractor qualifications. We will also present methods to provide protection for the owner in future pricing and technological advances, which is rarely part of the scope of the project.

Speaker: Greg Bradshaw, owner of Bradshaw Building Solutions, has 45 years experience in the construction industry, the last 34 years focusing on re-commissioning, building automation systems, energy management, energy retrofits and smoke control systems. Greg has worked with controls/integration companies, a mechanical design/build firm, a BAS manufacturer as regional manager, an engineering firm specializing in commissioning & retro-commissioning. Greg now has his own company focusing on re-commissioning, smoke control & building automation system consulting. Greg has spoken many times about a number of subjects, including Re-Commissioning & Commissioning, Energy Management Systems, Web-based BAS, Building Systems

Interoperability, Energy Retrofits, Control Strategies, Smoke Control Systems and Networks & the BAS.

2:35-3:30: BAS for Large Campuses

BACnet in large systems: This workshop will cover many topics that facility owners, designers and operators should consider when developing a large BACnet network. This workshop will include items such as how to select multiple vendors and determining which vendors workstation to use as the common interface point to the system. It will also include setting up the naming and addressing conventions. Finally the workshop will cover considerations when determining what type of 3rd party devices (Boiler, Chiller's, RTU's) will be allowed on the network.

Speaker: Jeff Lucas has a total of 17 years experience in the building automation industry. Rocky Mountain Energy Services specializes in energy auditing, retro-commissioning, HVAC system optimization and control system installations. Prior to starting Rocky Mountain Energy Services in 2007 Jeff designed and managed Douglas County School District's building automation network. In the beginning of his employment with Douglas County Schools, he quickly realized the need for interoperability and standardization. Jeff researched the options and decided on BACnet. Currently 65 of the school district's 74 buildings now have web-based BACnet building automation systems. The network currently consists of devices from 11 different manufacturers.

3:35-4:30: Transforming BAS Data Into Situation Management

Smart buildings have sensors and meters to measure and create data regarding a building's performance. Building owners and facility managers are experiencing exponential increases in the volume of data. However, additional data does not necessarily provide "Situation Awareness" and "Situation Management". The challenge is to transform data into meaningful information that can result in increased operational efficiency and effectiveness. The proven methodology to transform data into information is a "human centered approach" that addresses types of information, task requirements, and the capabilities and limitations of the human. This methodology defines the information (situation awareness) and interaction (situation management) requirements necessary for effective building systems management work processes. This presentation addresses the core elements and principles of "human centered approach" design, how these can be applied to integrated building systems platforms and the benefits from designing and implementing a Human Centered Integrated Systems solution.

Speakers: Ric Barreth is a Managing Partner of Human Centered Solutions, has 25 years of human performance consulting experience specializing in the design and operation of critical operating facilities. Human Centered Solutions is an industry leader in the field of Human Machine Interface (HMI) design, are frequent contributors to site and corporate standards for HMI design methods, and stay current in the field with frequent hands-on design projects. One of Ric's recent projects was as a team member responsible for design of the new Integrated Operations Center for the Department of Veterans Affairs. Other key assignments include co-author of the Abnormal Situation Management Consortium's "Effective Operations Practices Guidelines," design of 45+ mission critical operating facilities, and leading research and development of operator staffing level assessment methods.

Track 5 – Indoor Air Quality

Sponsored by: Indoor Air Quality Association

8:00 – 8:55: ANSI/SMACNA 008-2008 IAQ Guidelines for Occupied Buildings Under Construction

ANSI/SMACNA Standard 008-2008 is intended as an authoritative source for providing project management guidance in maintaining satisfactory indoor air quality (IAQ) of occupied buildings undergoing renovation or construction. This talk will discuss the various aspects of the standard including how to manage air pollutant sources, control measures, quality control and documentation and communication with occupants.

Speaker: Mark Terzigni graduated from The Ohio State University with a Bachelors of Science in Mechanical Engineering. As project manager, Mark Terzigni works with others in the Technical Resources Department to help develop and publish the technical manuals produced by SMACNA as well as providing interpretations to SMACNA standards through the Technical Inquiry Process. He is currently a Member of ASHRAE, National Capitol Chapter, and a prior member of the Columbus, Ohio Chapter. He is vice chairman of ASHRAE Technical Committee 5.2 Duct Design and a member of ASHRAE Technical Committee 7.9 Commissioning

9:00 – 9:55: Vapor Barrier Application and Misapplication

This talk will deal with vapor barrier theory and applications in crawl spaces, high humidity indoor environments, and in exterior walls to prevent moisture intrusions. It will also include a discussion of materials and installations and their relative pros and cons and the differences in installation and applications between high and low outdoor humidity environments.

Speaker: David E Banes is a Certified Mold Inspector and a Certified Mold Remediator, and he is a graduate of the Certified Mold Inspector & Contractors Institute. He is also a licensed general contractor in the State of Colorado. Mr. Banes and RMRC Services have worked extensively with builders and engineering firms in the Denver metro area to develop and implement mold remediation and prevention procedures, as well as eliminating water intrusion problems.

10:10 – 11:05: Indoor Asthma Triggers: Evidence, Evaluation and Remediation

This presentation will focus on summarizing the evidence for asthma exacerbation and causation by major indoor asthma triggers including: pet allergens, rodent allergens, cockroach allergens, tobacco smoke, volatile organic compounds, and mold. Methods for evaluating and remediating these allergens and irritants in indoor environments will also be discussed.

Speaker: Dr. Mike Van Dyke PhD., CIH is an Assistant Professor at National Jewish Health. He earned a Ph.D. in Environmental Health from Colorado State University and is a Certified Industrial Hygienist. For the last three years, Dr. Van Dyke has been working on several asthma and allergy related research projects. These projects have involved measuring both airborne and settled dust allergen levels and relating these exposures to asthma outcomes.

1:35 – 2:30: Healthy Homes Overview-Don't be Left Behind

IAQA has identified Home Health issues as one of the developing trends in our industry affecting all facets of the indoor environment. In addition to the multitude of individual organizations, governmental agencies, non-profits, and medical associations already active, there are numerous coalitions and joint initiatives; some with stimulus funding. Because they have more money and clout we risk becoming irrelevant and left behind. Included with the presentation is a list of resources and citations.

Speaker: Carl Grimes is President of Healthy Habitats LLC, Vice President of the Indoor Air Quality Association, Procedural Development Chair of the Indoor Environmental Standards Organization, and serves on the American Academy of Allergy, Asthma, and Immunology Joint Task Force developing home health assessment practice parameters for physicians.

2:35-3:30: Complying with the New EPA Lead Safety Renovation, Repair and Painting Rule (RRP Rule)

According to the RRP Rule (40CFR part 745), on or after April 22, 2010, all renovations in target housing, or child-occupied facilities

constructed prior to 1978, must be directed by Certified Renovators and performed by Certified Renovators or individuals trained on site by a Certified Renovator. This rule will affect all trades including but not limited to residential real property owners and/or managers, general contractors, electricians, plumbers, carpenters and painters. This discussion will shed some light on what you and your company will need to do to be in compliance with this new Rule.

Speakers: Derek D'Avignon has a BS degree in Environmental Science from the University of Buffalo and has been a practicing EPA Certified Lead-based Paint Risk Assessor for 10 years. Mr. D'Avignon is currently in the application process with the EPA to become a "Certified Lead Renovator Trainer" Mr. D'Avignon is employed by Foothills Environmental, Inc. an Industrial Hygiene, Safety and Environmental Services company that has been servicing Colorado and a handful of other states since 1998.

3:35-4:30: IESO 4310/Portable High Efficiency Air Filtration (PHEAF) Device Field Testing and Validation Standard

This standard, currently out for public review, provides minimum in-field testing requirements for portable high efficiency air filtration devices. These devices include vertical and horizontal PHEAF devices, movable vacuums, hand held vacuums, and other filtered suction devices used for cleaning surfaces for the purposes of removing dust, dirt, mold, asbestos, lead, soot and other undesired particulate and environmental contaminants. This talk will present an outline of the proposed standard and a demonstration of actual field testing protocols.

Speakers: Chris Watson is the Owner of AAMREX Environmental Services, LLC. Environmental Assessment Group, LLC and Signature Building Concepts, LLC. He is a Council Certified Indoor Environmental Consultant as well as a Council Certified Microbial Remediation Supervisor. Chris has been in the restoration and remediation industry since 1990 and has pioneered many different remediation techniques in addition to the DrySPACE vapor barrier system. He has testified as an Expert Witness on numerous building defect cases and is considered an expert in building envelope moisture intrusion and related issues.



“Sustaining Our Future by Rebuilding Our Past”

2010 Rocky Mountain Chapter ASHRAE Technical Conference

7:30-8:00	Registration				
Tracks	HVAC&R Fundamentals	HVAC&R Systems & Applications	Sustainability	Building Automation	Indoor Air Quality
Sponsored by:	CFM Company	McNevin Company	Johnson Controls	LONG Building Technologies	Indoor Air Quality Association
8:00-8:55	<i>Structural Engineering 101</i> Ralph Rempel Martin/Martin, Inc.	<i>Energy Recovery Methods</i> Tom Brooke Heat Pipe Technologies	<i>High Performance Building Rating systems and Standards</i> Linda Morrison	<i>DDC Basics</i> Dave Kahn The RMH Group	<i>ANSI/SMACNA 009-2008 IAQ Guidelines for Occupied Buildings Under Construction</i> Mark Terzingi SMACNA
9:00-9:55	<i>Acoustics and Vibration Control</i> Kelly Stumpf Shen Milsom Wilke	<i>Appendix G, What the F?</i> Scott Martin The RMH Group Aleka Pappas Enermodal Engineering	<i>Net Zero Buildings</i> Paul Hutton Hutton Architecture Studio	<i>Specifying BAS</i> Ira Goldschmidt Goldschmidt Engineering Solutions	<i>Vapor Barrier Application and Misapplication</i> David E. Barnes RMRC Services
9:55-10:10	Morning Break & Vendor Exhibits				
10:10-11:05	<i>Technologies for Efficiency</i> Michael Haughey Silvertip Integrated Engineering Consultants	<i>Introduction to Chilled Beams</i> James Murphy Long Building Technologies	<i>Legal Issues</i> Phil Cardi & Alfred Zarlengo Van Gilder Insurance Corp.	<i>LEED V3 as it Relates to Controls</i> Ken Nekvasil FHS Controls	<i>Indoor Asthma Triggers: Evidence, Evaluation and Remediation</i> Mike Van Dyke, PhD National Jewish Health
11:05-11:30	Vendor Exhibits				
11:30-1:05	Lunch Break and Keynote Address:	ASHRAE, Standard 189.1, the Advanced Energy Design Guides, Net Zero Energy Buildings, and Future ASHRAE Directions By: Lynn Bellenger ASHRAE President Elect Sponsored by: Western Mechanical Solutions			
1:05-1:35	Vendor Exhibits				
1:35-2:30	<i>Psychrometrics and Energy Recovery</i> Scott Laurila Greenheck Co.	<i>VFD's-Application</i> Jeff Miller ABB, Inc.	<i>Integrated Design</i> Barry Stamp Shaffer-Beacom Engineering & Consulting	<i>BAS Retrofit for Sustainability</i> Greg Bradshaw Bradshaw Building Solutions, Inc.	<i>Healthy Homes Overview – Don't be Left Behind</i> Carl Grimes
2:35-3:30	<i>Electrical Engineering 101</i> Wes McKinney The RMH Group, Inc.	<i>Variable Refrigerant Volume-Designing with Multi-Splits</i> Corey Barlett Daikin AC	<i>Continuous Commissioning</i> Celeste Cizik EMC Engineers	<i>BAS for Large Campuses</i> Jeff Lucas Rocky Mountain Energy Services	<i>Complying with the New EPA Lead Safety Renovation, Repair and Painting Rule (RRP Rule)</i> Derek D'Avignon Foothills Environmental, Inc.
3:35-4:30	<i>Variable Frequency Drives</i> Jeff Miller ABB, Inc.	<i>Saving Energy with Fans</i> Doug Yamashita ACME Engineering and Manufacturing Corp.	<i>GeoExhcange Systems for Retrofit Applications</i> Trey Austin Geoenergy Services	<i>Transforming BAS Data Into Situation Management</i> Ric Barreth Human Centered Solutions, LLP	<i>IESO 4310/Portable High Efficiency Air Filtration (PHEAF) Device Field Testing and Validation Standard</i> Chris Watson AAMREX Environmental Services, LLC
4:30-5:00	Conference Conclusion and Cash Bar				

Speakers and Topics Subject to Change

www.rockymtnashrae.com

REGISTRATION FORM

18th Annual Technical Conference

Friday, April 16, 2010

Sheraton Hotel Denver West – 360 Union Boulevard, Lakewood CO 80228

“Sustaining Our Future by Rebuilding Our Past”

Presented by:

The ASHRAE Rocky Mountain Chapter

Register by April 9th, 2010 to ensure space availability.

Checks received after April 10th or walk-ins the day of the seminar will be accommodated pending space availability.

Please photocopy this form for additional attendees and for your records.

Individual Registration:

Your Name _____ Title _____

Company _____

Mailing Address _____

Phone _____ Fax _____

Company Registration:

Company _____

Mailing Address _____

Phone _____ Fax _____

Seminar Preference: (This is for space allocation only. You may attend any seminar during the conference.)

Check Your First and Second Preference

HVACR Fundamentals

HVACR Systems and Applications (formerly Advanced)

Green Guide (formerly Energy and Environment)

Building Automation

Indoor Air Quality

Are you a Member of ASHRAE IAQA USGBC Other _____

Please register me for...

Please register my company for... _____ passes. 10% Discount for 5 or more
(quantity)

Company Passes.

Check Your Preference

Full day @ \$175.00, (Lunch included), (Total Number) _____

1/2 day at \$125.00, (Lunch included), (Total Number) _____

Morning Session Afternoon Session

Late Registration, received after April 9, 2010, will be:

\$185.00, (includes lunch), \$135.00 1/2 day, (includes lunch)

Enclosed please find a check for: \$ _____

Please Make Checks payable to Rocky Mountain Chapter ASHRAE

Payments with Master Card or Visa can be made at the Chapter's Website:

www.rockymtnashrae.com

Please mail check and registration form to: **Bill Mele- Indoor Environmental Solutions**

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Littleton, CO 80127

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