



Rocky Mountain Chapter

22nd Annual Technical Conference:

SHAPING THE NEXT...

Friday May 2nd, 2014

Register and Pay at www.rockymtnashrae.com

Sheraton Denver West Hotel
360 Union Boulevard
Lakewood, CO 80228



Co-Sponsored by Rocky Mountain

This year's Technical Conference theme is "Shaping the Next...". Our Keynote Speaker will be Tom Werkema, ASHRAE Society Vice President. Mr. Werkema, is a ASHRAE Society Vice President, member of the Executive Committee and Board of Directors, and member of the Finance Committee and Coordinating Officer of Society Planning Committee. Among many other roles within ASHRAE, Mr. Werkema has served on the Board of Directors of the Alliance for Responsible Atmospheric Policy, a leading fluorocarbon advocacy group, the Board of Directors for the International Climate Change Partnership, various committees for the Air Conditioning, Heating and Refrigeration Institute, including Chair of the Responsible Use Guide work group, CPI Rigid Foams Committee and leadership roles in several other trade associations.

This year's conference will include the Fundamentals Track, Systems and Applications Track, the Sustainability Track, the Building Automation Track, and a Healthcare Track. There will be a broad range of information to entertain both experienced and novice engineers.

This is the 22nd annual ASHRAE Rocky Mountain Chapter Technical Conference. The chapter prides itself on providing quality speakers and presentations to the HVAC&R community. We will be providing PDHs and CEUs as usual, as well as USGBC/GBCI approved sessions.

Thank-you:

This event has been ongoing for over 20 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.

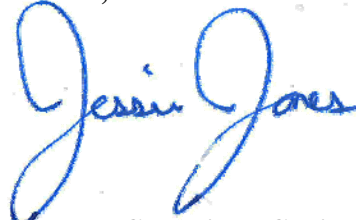
Technical Conference Committee:

Tony Anderson – AMI Mechanical
Greg Bradshaw- Bradshaw Building Solutions
Trevor Bromberg – McGrath, Inc.
Nico D' Alessandro - Siemens
Sara Frame – Eaton
Mike Fulton - Western Mechanical Solutions
Larry Gelin – CFM Company
Ira Goldschmidt – Goldschmidt Engineering
Jessie Jones – RMH Group, Committee Chair
Scott Jones – Air Purification

Brian Lynch – Western Mechanical Solutions
Bill Mele – Chemistry & Industrial Hygiene, Inc
Ken Nekvasil – ATS Rocky Mountain
Jon Rundquist – Air Purification Company
Megan Sterl – Eaton
Cay Strother – Denver Water
Michelle Swanson – RMH Group
Pieter van der Mersch - ECO Associates
Craig Wanklyn – M-E Engineers

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

Thank You,



Jessie Jones, Committee Chair

2014 Rocky Mountain Chapter ASHRAE Technical Conference “Shaping the Next...”

7:30-8:00	Registration				
Tracks	HVAC&R Fundamentals	HVAC&R Systems & Applications	Sustainability	Building Automation	Healthcare
Sponsor:	McNevin Company	CFM Company	Johnson Controls Inc.	LONG Building Technologies	Chemistry & Industrial Hygiene Inc.
8:00-8:55	<i>Altitude Effects on System Design</i> Michael Haughey Silvertip Integrated Engineering	<i>Fan System Effect and Efficiency Grade</i> Matthew Spink, P.E. Greenheck	<i>How LEEDv4 Impacts Energy Professionals and Mirrors Broader Sustainability Trends</i> Dan LeBlanc YR&G	<i>DDC Basics</i> Dave Kahn The RMH Group	<i>Ventilation vs. Energy in Healthcare</i> Jeff Elsner The RMH Group
9:00-9:55	<i>Psychrometrics</i> Michael Fulton Western Mechanical Solutions	<i>Filtration for Cooling Towers and Evaporative Condensers</i> Dennis Jamison Puroflux	<i>Sustainable Kitchen Design-Greening of the Burrito: How Chipotle Has Increased Energy Performance</i> Richard Jones National Engineering	<i>Energy Efficient Control Sequences</i> Steve Nixon Johnson Controls	<i>Healthcare Codes and Standards</i> Mark Jelinske Cator Ruma & Assoc.
9:55-10:10	Morning Break & Vendor Exhibits				
10:10-11:05	<i>Trouble-free Methods of Applying Evaporative Cooling for Energy Conservation</i> Rick Phillips The RMH Group	<i>Shop HVAC Applications Dust, Welding, and Automotive Exhaust Removal</i> Mike Sirois AQC	<i>Continuously Achieving Energy Savings with Ongoing Commissioning</i> Celeste Cizik Upkeep Energy Erik Jeanette Iconergy	<i>Systems Integration/Interfacing with Packaged Equipment</i> Cory Knopp Setpoint Systems	<i>Construction Challenges/Best Practices for Hospitals</i> Joe Hanlin Haselden Construction Dan Strait US Engineering Alex Infante The RMH Group Steve Ferguson Air Purification
11:05-11:30	Vendor Exhibits				
11:30-1:05	Lunch Break and Keynote Address:	ASHRAE and Climate Change Science By: Tom Werkema, Jr. Vice-President ASHRAE Sponsored by: Western Mechanical Solutions			
1:05-1:35	Vendor Exhibits				
1:35-2:30	<i>Fan Fundamentals</i> Ryan Johnson Twin City Fan	<i>Tips for Design and Construction of High Quality Buildings</i> Pieter van der Mersch ECO Associates UC Boulder (Retired)	<i>New Belgium Brewing Company – Keeping our Energy Edge Inside Fort Zed</i> Bethany Beers, New Belgium	<i>How to Best Design/Install/Commission BAS</i> Pat Lester CU Boulder Joe Ellison Saunders Const. MEP Ken Nekvasil ATS Rocky Mountain Ira Goldschmidt Goldschmidt Eng. Solutions	<i>Humidification in Healthcare Facilities</i> Jason Strauss NEP Ltd.
2:35-3:30	<i>Load Calculations</i> Michael Brandemuehl UC Boulder	<i>AHRI 1060 Certification for Air-to-Air Heat Exchangers</i> Blake Erb Venmar CES	<i>What Energy Modeling Is, and What It Is Not: A Realistic Expectation of Energy Modeling</i> Rebecca Reel The RMH Group Sean Beilman BCER Engineering Peter Ellis Big Ladder Software Sue Reilly Group 14	<i>BAS in the Cloud</i> Jon DeRidder Enabled Energy Ken Nekvasil ATS Rocky Mountain	<i>Healthcare Short Set Vertical Turbine Pump Applications Design</i> David Stover Goulds Water Technologies
3:35-5:00	Afternoon Technical Keynote Address And Open Bar	ASHRAE 90.1 - 2013 By: Sean Beilman, P.E., HPDP, LEED AP - BCER Engineering Speaker Sponsored by: Air Purification			

Please note - Speakers and Topics Subject to Change – Some titles on this sheet are condensed for space purposes.

www.rockymtnashrae.com

“Shaping The Next...”

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.

Your Cost:

(Early registration before April 18th)

½ day: \$ 125 (lunch included)

Full day: \$ 175 (lunch included)

(10% discount to companies sending 5 or more)

Cost for late registration after April 18th

½ day: \$ 150 (lunch included)

Full day: \$ 190 (lunch included)

When & Where:

Friday, May 2, 2014 at the: Sheraton Denver West Hotel
360 Union Blvd.
Lakewood, CO 80228

Professional Development Hours (PDH):

A form is attached to document your participation in the Technical Conference, which assigns the appropriate PDHs to each session. The Chapter is working on GBCI credits. Please check the website for updates.

Luncheon Keynote Address:

Sponsored by: Western Mechanical Solutions

ASHRAE and Climate Change Science

This presentation will discuss Climate Change Science - both the knowns and unknowns. A new Intergovernmental Panel on Climate Change report was issued late October 2013, the 6th one since the first report in 1990. When discussing complete science, some things are not obvious. For instance, ice does not explain sea level rise - yet sea levels are rising. So why? The good news is that Colorado is safe!

Beyond science, Mr. Werkema will discuss some of the political issues internationally and then shift to U.S. governmental policies, such as the significant climate change regulations being issued by the federal government, states and regions.

Thomas Werkema Jr. Vice-President ASHRAE. For the past 20 years, Mr. Werkema was involved in and attended United Nations meetings of the Montreal Protocol on Substances that Deplete the Ozone Layer and the Kyoto Protocol on Climate Change. Mr. Werkema is an internationally known expert on Climate Change and Ozone Depletion science and politics and was recognized for his contribution to the Intergovernmental Panel on Climate Change Nobel Peace Prize award, shared with Al Gore.

Mr. Werkema, is a ASHRAE Society Vice President, member of the Executive Committee and Board of Directors, and member of the Finance Committee and Coordinating Officer of Society Planning Committee. Among many other roles within ASHRAE, Mr. Werkema has served on the Board of Directors of the Alliance for Responsible Atmospheric Policy, a leading fluorocarbon advocacy group, the Board of Directors for the International Climate Change Partnership, various committees for the Air Conditioning, Heating and Refrigeration Institute, including Chair of the Responsible Use Guide work group, CPI Rigid Foams Committee and leadership roles in several other trade associations.

Afternoon Technical Keynote:

And Open Bar

Keynote Speaker Sponsored by: Air Purification

ASHRAE 90.1-2013

ASHRAE Standard 90.1 – 2013 was released in the fall of 2013. The Mechanical Chapter, Section 6 of 90.1 - 2013 includes roughly 40 changes to 90.1 – 2010. These changes help reduce energy consumption by changing the minimum HVAC requirements and further broadening the scope of the standard. This presentation will cover some of the major changes to the Mechanical Chapter of the standard that will affect mechanical engineers.

Sean Beilman, P.E., HPDP, LEED AP is the Sustainable Services Manager at BCER Engineering. Mr. Beilman has over ten years of experience in the design of HVAC and plumbing systems for

governmental and educational facilities, office buildings, resorts, healthcare, and data centers. His area of focus while at BCER has been on sustainability and energy efficient design. Beyond the traditional role as mechanical engineer, Mr. Beilman assists the BCER team with current and practical sustainable design solutions. Mr. Beilman is an active ASHRAE member, participating at both the local and national level. Currently Mr. Beilman is a Voting Member of the ASHRAE Standard 90.1 Energy Cost Budget Subcommittee.

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

Track 1 – HVAC&R Fundamentals

Sponsored by: McNevin Company

8:00 – 8:55: Altitude Effects on System Design

This talk focuses on a range of system design topics where an awareness of high altitude considerations is essential to good design. Given the current emphasis on “right-sizing”, proper consideration of high altitude effects can make the difference between success and the other possibility. Subjects include airflow calculations, fan selection, ductwork, air-cooled equipment, cooling towers, motors, combustion equipment, pumps, evaporative coolers, shop drawing review to confirm compliance, and basebal. Even new types of equipment such as condensing boilers still require high altitude design consideration.

Speaker: Michael D. Haughey, P.E., HBDP, CEM, LEED AP

Michael is the Principal of Silvertip Integrated Engineering Consultants. 40 years of experience in HVAC & Mechanical consulting, facilities engineering, energy analysis, systems commissioning, systems troubleshooting, and sustainability consulting. Past President Rocky Mountain Chapter ASHRAE; CRES Board of Directors & Secretary, USGBC – Colorado Board of Directors, Education Director, Programs Coordinator, Greenbuild 2006 Host Committee Chair.; Keynote Speaker for the Rocky Mountain Chapter ASHRAE 2004 Annual Tech Conference. Past adjunct professor, HVAC Design, CU Denver and CU Boulder. Specialization in alternative and energy-conserving systems such as indirect-direct evaporative cooling, mass thermal storage, ice thermal storage, ground-source heat pumps, solar heating, energy audits, energy retrofits, natural ventilation, peer review, troubleshooting, sustainability consultation, net-zero energy systems. Developed and presented over 60 seminars

9:00 – 9:55: Psychrometrics

This presentation will cover the basics of psychrometrics and the psychrometric chart. Terminology, chart layout, and uses will be discussed. How to use a psychrometric chart for system design will also be discussed.

Speaker: Michael Fulton, P.E., Western Mechanical Solutions

Michael Fulton, P.E. founded Western Mechanical Solutions to focus on minimizing the energy use of buildings through innovative application of engineering. WMS represents various energy recovery products. Mike has 26 years' experience in equipment sales, consulting and construction. He graduated from the University of Maine with a degree in Mechanical Engineering. He is actively involved with ASHRAE, past

president of the Rocky Mountain Chapter (2002-2003), has been involved with the local ASHRAE tech conference since 1996, and has been the north section (Fort Collins) chair since 2008.

10:10 – 11:05: Trouble-free Methods of Applying Evaporative Cooling for Energy Conservation

Evaporative cooling can provide a significant amount of the cooling needs in this climate, but it has developed a reputation as being problematic, and consequently is not used as much as it should for high-end commercial applications. This talk will cover the performance of evaporative cooling systems, debunk the myths and explain how it can be applied so that problems are minimized. When applied in conjunction with chilled water cooling, energy savings of 30% can be achieved, which can provide four LEED points. Case histories of successful projects will be presented.

Speaker: Rick Phillips, P.E., LEED AP, The RMH Group, Inc.

Rick is a Senior Engineer with the RMH Group. He has more than 28 years experience in the HVAC industry; including 6 years as a facilities engineer for the University of Colorado at Boulder, 5 years as a design engineer for in-house construction crews at the CU Medical Center, and 17 years as a consultant.

1:35 – 2:30: Fan Fundamentals

Attendees will be trained on the basics of commercial / industrial fans including common fan types and frequently used terms. Topics to be covered include the different types of impellers and reasons for using each, a general overview of fan construction options and why they should or should not be used for certain applications, as well as a high level discussion of other components (motors, v-belt drives, dampers, etc) which can be added to fans.

Speaker: Ryan Johnson, Twin City Fan

Mr. Johnson has more than 15 years of experience in the HVAC industry and has held a variety of positions working for multiple equipment manufacturers. His roles have included technical product support and application as well as factory direct OEM and international sales. The majority of his work has been related to fans and blowers, but has also supported specific market segments such as laboratory exhaust systems, agricultural processes and mine / tunnel ventilation.

2:35 – 3:30: Load Calculations

This presentation will cover cooling load calculations, including design-day weather and solar data, building heat gains, and the translation of heat gains to cooling loads. The session will focus on exact and approximate ways to calculate the effects of transient conduction through the envelope, heat gains due to solar and internal sources, ventilation and infiltration, and the effect of thermal mass to reduce and delay cooling loads. The modern methods will be applied to develop a simple spreadsheet load calculator and compared with older hand calculations.

Speaker: Michael J Brandemuehl, PhD, PE, FASHRAE

Michael is a Professor of Civil, Environmental, and Architectural Engineering at the University of Colorado at Boulder with an appointment as Professor of Environmental Design. He performs teaching and research related to the design, operation, and analysis of building energy systems, with emphasis on the modeling and simulation of HVAC&R systems and their controls, smart building systems, and application of renewable energy technologies. Recent activities have focused on integration and control of solar thermal and PV technologies for building design and performance assessment.

Track 2 – HVAC&R Systems & Applications

Sponsored by: CFM Company

8:00 – 8:55: Fan System Effect and Fan Efficiency Grade

In Part 1 of this presentation, the speaker will present Industry accepted data on fan system effect, which can quantify the air performance and energy effects of imperfect airflow into or out of a fan. In Part 2, the speaker will present the new Fan Efficiency Grade (FEG) metric that is included in ASHRAE 90.1-2013.

Speaker: Matthew Spink, P.E., Greenheck Fan Corporation

Matthew Spink is currently the Western Regional Sales Manager for Greenheck, residing in Schofield, WI. He has been with Greenheck for eight years and has acted as an application engineer and product manager for industrial fans, with expertise in centrifugal and vaneaxial design and application. Matt holds a B.S. and M.S. in engineering from the University of Minnesota.

9:00 – 9:55: Filtration for Cooling Towers and Evaporative Condensers

The speaker will describe the various system architectures of cooling tower filtration systems and their benefits. He will also describe the different types of filters and further define the benefits and drawbacks of each in terms of filtration efficiency, water use, and power consumption. Finally, the speaker will provide design guidance and recommendations for various system types.

Speaker: Dennis Jamison, Puroflux Corporation

Dennis Jamison joined Puroflux Corporation in 2005 after working as a specialist in automation and controls that are commonly utilized in HVAC systems. Since coming on board at Puroflux, Dennis was initially an applications specialist and then became the Puroflux Sales Manager. Dennis' duties include educating Puroflux representatives and engineers of all facets of industrial filtration. Dennis also pursues continuing education in HVAC through periodic trade classes. Prior to Dennis' career in electrical distribution; he served honorably in the United States Navy.

10:10 – 11:05: Shop HVAC Applications – Dust, Welding, and Automotive Exhaust Removal

The speaker will provide a brief history of the dust and fume control industry, and the evolution of dust and fume control equipment of the past. He will also provide resources for the design engineer to reference, including the Industrial Ventilation Handbook and NFPA, that are required for design. Finally, he will present the selection method and required equipment for various applications - wood dust removal, metal dust removal, source capture of fumes, and automotive exhaust.

Speaker: Mike Sirois, AQC

Mike Sirois graduated from the Laval Institute of Technology in Montreal and is currently the Vice President of AQC. He has been responsible for the design and development of all of AQC's industrial ventilation products. He serves as a resource to the engineering community in particular to help engineers' designs comply with NFPA regulations.

1:35 – 2:30: Tips for Design and Construction of High Quality Buildings

The presenter will cover the design and construction practices that have proven to be successful in a large university campus.

Speaker: Pieter van der Mersch, ECO Associates

Pieter L. van der Mersch, P.E. was born in Mexico in 1947 and emigrated to the U.S.A. in 1979. He holds a B.S. in Mechanical and Electrical Engineering from the Instituto Tecnológico de Monterrey, and obtained M.S. degrees in Industrial Engineering and Mechanical Engineering from universities in the U.S.A. He is a licensed professional engineer in Mexico and the U.S.

Pieter is a life member of ASHRAE, a life member of the American Solar Energy Society (ASES), and a life and founding member of the Colorado Renewable Energy Society. Has given presentations and published papers on a wide range of professional subjects, both nationally and internationally.



He worked for eight years in the Product Engineering Department of the Monterrey, Mexico factory of John Deere, and worked in HVAC design since 1981.

Most recently, Pieter worked at the University of Colorado at Boulder from 1984 until his retirement in 2013. Most of those years as Manager of Facilities Mechanical Engineering, where he was involved in engineering and physical-plant management, development of design and construction standards, quality-assurance methods and guidelines, full-scope commissioning, and retro-commissioning. In addition to hundreds of small and medium-sized projects, he has been involved in over 25 large projects, including major renovations and new buildings.

2:35 – 3:30: AHRI 1060 Certification Program for Air-to-Air Heat Exchangers

The speaker will provide a description of the AHRI third-party certification program for air-to-air heat exchangers, which includes heat pipes, plate air heat exchangers, and energy recovery wheels. The program certifies heat exchangers for energy recovery effectiveness, cross-contamination (EATR) and outdoor air correction factor (OACF). These factors have significant impacts for compliance with ASHRAE 62.1 and energy performance.

Speaker: Blake Erb, Venmar CES

Blake Erb is a R&D Design Engineer and Air-to-Air Energy Recovery Technology Lead for Venmar CES Inc., an innovative manufacturer of cost-effective, energy efficient, energy recovery solutions for the commercial ventilation market. Mr. Erb has spent over 9 years researching and developing novel energy recovery technologies for building ventilation systems.

Mr. Erb holds both a Bachelor's in Mechanical Engineering and a Master's of Science Degree from the University of Saskatchewan. Mr. Erb is a member of the Association of Professional Engineers and Geoscientists of Saskatchewan, Research chair of ASHRAE TC 5.5 Air-to-Air Energy Recovery and the current ASHRAE Saskatoon Chapter President.

Track 3 – Sustainability

Sponsored by: Johnson Controls, Inc.

8:00 – 8:55: How LEEDv4 Impacts Energy Professionals and Mirrors Broader Sustainability Trends

This session will explore the ways LEEDv4 impacts Energy Professionals with respect to energy modeling, occupant comfort, and energy systems design. Also to be discussed are general trends in sustainability such as an increased focus on integrated design, existing building commissioning, and changes in daylighting and health metrics.

Speaker: Dan LeBlanc, YR&G

Dan is a Senior Sustainability Manager at YR&G with 15 years of experience in advanced performance analysis, energy optimization, daylight modeling, and project management. He has worked on a wide range of project types nationally and internationally, including institutional, manufacturing, core and shell, tenant fit-out, master plan, and mixed-use. Dan is also well versed in the construction process, having managed several successful residential and institutional building projects as a General Contractor.

Additionally, Dan has extensive experience as a presenter and educator. He has presented on topics as varied as integrated design, cost-benefit analysis, energy monitoring and feedback, energy modeling, LEED project management, and he has led LEED trainings for corporate audiences.

9:00 – 9:55: Sustainable Kitchen Design-Greening of the Burrito: How Chipotle has Increased Energy Performance

This session will explore the key considerations and strategies for sustainable commercial kitchen design including the history of ventilation design schemes, current best practices, and new innovation and technology. There will be an emphasis on actual case studies with real before and after energy data.

Speaker: Richard Jones, PE LEED AP - Owner/Principal, National Engineering

Rich has been practicing engineering for over 30 years. The main focus of his practice has been in serving long term building owners for facilities such as retail, industrial, medical, educational, and libraries. As part of the engineering team for Chipotle, Rich has developed many of the corporate engineering design standards and continues to aid Chipotle in the research and development of their environmental friendly facilities. Rich has been involved in five restaurant projects that have sought LEED certification (1 Platinum, 1 Gold, 1 Silver, 1 Certified and 1 pending - seeking Silver). Recently Rich has joined the IKECA committee drafting the ANSI standard C10-2011 Standard for Cleaning of Commercial Kitchen Exhaust Systems.

10:10 – 11:05: Continuously Achieving Energy Savings with Ongoing Commissioning

One time or periodic commissioning can get your building running in good shape but if left unattended, building operation can slip over time. Ongoing commissioning (OCx) helps to keep your building well with continuous attention. This presentation will provide an overview of OCx and the important performance tracking component. Automated fault detection and diagnostic (FDD) software tools will be covered including how these tools are used to identify equipment operational faults, what products are available, and how FDD can be applied to your building to assure that energy savings persist over time. Lessons learned from projects will be provided.

Speaker: Celeste Cizik, PE, CEM, LEED-AP, Upkeep Energy

Celeste has a wide range of experience in building systems and energy engineering including retro-commissioning, energy analysis, mechanical system design, and energy planning. She has conducted energy projects at facilities and campuses across the country and has led energy trainings through the Federal Energy Management Program. She has a degree in Architectural Engineering from the University of Colorado-Boulder and an MBA from the University of Colorado Leeds School of Business.

Speaker: Erik Jeanette, PE, Iconergy

Erik has been in this industry for 20 years, which includes 3 years as a controls programmer and engineer, and has been in the building commissioning field for the past 13 years. Erik manages retro-commissioning and new construction commissioning projects, as well as energy metering and controls design projects.

1:35 – 2:30: New Belgium Brewing Company – Keeping our Energy Edge Inside Fort ZED

New Belgium Brewing Company is located within FortZED, a partnership with local government, academia & industry, NBB has implemented several projects that align with both their Core Values and Beliefs and the goals of FortZED.

- 1) How New Belgium's sustainability push improved processes.
- 2) How the FortZED has impacted New Belgium.
- 3) Lessons NBB has learned in Fort Collins & how they inform the new Asheville facility.
- 4) How NBB challenges their vendors & consultants to meet strategic energy & sustainability goals.
- 5) What it's like to go from consulting engineering to working for an owner in the brewing industry.

Speaker: Bethany Beers, LEED AP BD+C, New Belgium Brewing Company

Bethany Beers, Building and Energy Engineer with New Belgium Brewing Company, will be speaking after her recent transition from consulting engineer to owners representative. Bethany has over 10 years of industry experience in consulting, commissioning, energy auditing and LEED Consulting. She graduated from University of Wyoming with a degree in Architectural Engineering, Mechanical System Design. Bethany was President of the Pikes Peak ASHRAE chapter in 2007, and is currently Chair of the ClimateWise Project Assistance Committee.

2:35 – 3:30: What Energy Modeling Is, and what it Is Not: A Realistic Expectation of Energy Modeling

As energy modeling is used more often, are decision makers clear on what model results really mean? This moderated panel discussion of three expert energy modeling professionals will explore how energy modelers can use modeling as an effective tool while managing the expectations of the owner and design team.

Moderator: Rebecca Reel, LEED AP BD+C, is a mechanical engineer at The RMH Group, a mechanical, electrical, and industrial process engineering firm based in Lakewood, Colorado. She has six years of engineering experience designing mechanical systems for military and commercial projects. Rebecca's experience encompasses mechanical system design, LEED administration, energy modeling, life cycle cost analysis, drafting, and working for a general contractor. Rebecca has worked on 10 LEED projects in her career and is currently serving as a board member of the U.S. Green Building Council's Colorado Chapter. She is a graduate of the University of Colorado Boulder in mechanical engineering.

Panelist: Sean Beilman, P.E., HPDP, LEED AP is the Sustainable Services Manager at BCER Engineering, a full service Mechanical, Electrical, Plumbing, Energy, Fire Protection, and Life Safety consulting firm. Mr. Beilman has over ten years of experience in the design of HVAC and plumbing systems for governmental and educational facilities, office buildings, resorts, healthcare, and data centers. His area of focus while at BCER has been on sustainability and energy efficient design. Beyond the traditional role as mechanical engineer, Mr. Beilman assists the BCER team with current and practical sustainable design practices. Mr. Beilman served as the Rocky Mountain ASHRAE Sustainable Engineering Committee Chairman from 2009 to 2010 and is one of the co-founders of the Rocky Mountain Energy Simulation Engineers group. Currently he is a Project Subcommittee Voting Member of the ASHRAE Standard 90.1 Project Committee.

Panelist: Peter Ellis is President of Big Ladder Software and has been involved in developing building energy simulation software for more than twelve years. Peter has worked on the development of EnergyPlus both in graduate school and for the National Renewable Energy Laboratory (NREL). In addition to his work as a developer, Peter has been equally invested as a practitioner, applying the software to perform numerous whole-building energy analyses. He has successfully used EnergyPlus to model a variety of real-world projects ranging from an off-the-grid passive solar dormitory to the original Libeskind design for the World Trade Center Freedom Tower. He also has trained scores of new users in the intricacies of EnergyPlus at both US and international locations. Peter was also the original creator of the OpenStudio "legacy" plugin that couples SketchUp to EnergyPlus.

Panelist: Susan Reilly, P.E., BEMP, LEED AP BD+C, is the president of Group14 Engineering. Susan has worked with design teams throughout the U.S. to incorporate greater energy efficiency and sustainable design practices into their projects over the past 17 years. Susan is well-known for her energy modeling expertise and received the 2006 Practitioner of the Year Award from the U.S. chapter of the International Building Performance Simulation Association. She has worked as reviewer for LEED Energy and Atmosphere Credits and as technical support for the development of the Energy and Atmosphere sections of the reference guides for the USGBC LEED-NC, CI, and EB.

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, PE, LEED AP BD+C, The RMH Group Inc.

Dave Kahn is the Chief Mechanical Engineer 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 Vice-Chair of SGPC 13 "Specifying Direct Digital Control Systems", and is an ICC plans examiner for the International Building Code.

9:00 – 9:55: Energy Efficient Control Sequences

The focus of this seminar is on optimizing building systems performance and the integration of technology systems in buildings. We will cover about 30+ control strategies that could help any facility save energy, improve comfort and take care of HVAC equipment better. This seminar will explain the reasons behind the strategies and how to really make them work. With the dramatic increase in energy costs recently and an emphasis on reducing operating costs, this subject matter is timely. These strategies also play directly into the dramatic surge in building re-commissioning we are experiencing.

Speaker: Steve Nixon, Johnson Controls

Mr. Nixon has 34 years of technical and business experience working on projects with owners, engineers, and contractors to develop energy conservation and technology services solutions. His expertise is in the application of energy conservation methodologies and building systems integration technology. As a proven business development leader on major projects he understands the complexity and the processes required to plan, implement and deliver successful sustainable, energy efficient, building technology projects

10:10 – 11:05: Systems Integration / Interfacing with Packaged Equipment

Factory mounted controllers (packaged controls) are changing the landscape for today's building management systems (BMS). Equipment is arriving with serial/network communication capabilities and many new data points, along with BMS independent operating capabilities. What are the implications for our building designs, the role of the controls contractors, and building owners, and how do you set yourself up for a successful installation involving FMCs / packaged equipment?

Speaker: Cory Knopp

Cory Knopp is Vice President, Business Development at Setpoint Systems Corporation, a systems integrator headquartered in Littleton, Colorado. His previous work experiences have included operation and management of engineering plants aboard U.S. Navy warships; teaching duties at the U.S. Navy Surface Warfare Officers School for shipboard mechanical/electrical distribution systems and account management roles within the building automation and systems integration industry. Cory holds a bachelor's of science degree from the United States Naval Academy and an MBA from Colorado State University. He specializes in systems integration of building control and monitoring systems in mission critical facilities including data centers, military installations, R&D labs, DOE facilities, and university campuses.



Rocky Mountain

1:35 – 2:30: How to Best Design/ Install / Commission BAS

BAS is the most important tool provided in a building for comfort & energy efficiency. However, many BAS projects are challenged to achieve the ultimate value of what these system can really offer. We have assembled a panel consisting of various participants in the process (owner, GC/MEP, Consultant & BAS contractor) to learn how the overall process can be improved at every step to achieve what the owner REALLY needs.

Speaker: Pat Lester, CU Boulder

Pat has worked for the University of Colorado Boulder as a Building Automation Specialist for 8 years. He is certified for BacNet, LON, Andover, Tridium, and Automated Logic & currently working on the design team on most of the mechanical projects that the University is conducting.

Speaker: Joe Ellison, Saunders Construction MEP

Joe Ellison has been working as an MEP coordinator representing the general contractor since 1992. His experience includes semiconductor, laboratory, data center, healthcare, and office construction. He is a graduate of the University of New Mexico and holds a degree in mechanical engineering.

Speaker: Ken Nekvasil

Ken, Sales Manager for ATS Rocky Mountain, has been in the HVAC industry for nearly 30 years. He has extensive experience in building automation controls both from an operational and sales perspective. He is very familiar with BACnet based systems and integration to other systems.

Moderator: Ira Goldschmidt, Goldschmidt Engineering

Ira Goldschmidt, P.E., LEED-AP, Goldschmidt Engineering Solutions, Inc. has nearly 40 years experience in the building design and construction industry, much of which has focused on building automation system design, integration, construction and commissioning. He co-authored the ASHRAE Guideline 13 on "Specifying Direct Digital Controls".

2:35 – 3:30: BAS in the Cloud

Our presentation will provide the latest developments in building automation systems and cover how cloud computing coupled with cutting edge software has finally cracked the code with a SaaS based BAS. This session will explain how complex analytics done in the cloud using information sent from a BAS is now available to anyone with a minimal investment of time, money and effort.

Speaker: Jon DeRidder, Enabled Energy

Mr. Jon deRidder serves as CEO of Enabled Energy, a professional services firm focused on mission critical environments through its process of Discover / Optimize / Sustain. Jon brings experience in energy conservation, airflow management, due diligence and data center design. Jon works diligently to tackle the complex and elusive challenges facing mission critical environments today, while identifying and informing Enabled Energy customers of the future challenges on the horizon.

Speaker: Ken Nekvasil

Ken, Sales Manager for ATS Rocky Mountain, has been in the HVAC industry for nearly 30 years. He has extensive experience in building automation controls both from an operational and sales perspective. He is very familiar with BACnet based systems and integration to other systems.

Track 5 – Healthcare

Sponsored by: Chemistry & Industrial Hygiene, Inc.

8:00 – 8:55: Ventilation vs Energy in Healthcare

Ventilation design for healthcare occupancies and its energy impact: A discussion of methods and systems that protect patient health while providing better energy performance than the "standard" design

Speaker: Jeff Elsner, PE, LEED AP, The RMH Group, Inc.

Jeff Elsner, P.E., LEED AP, is a mechanical engineer at The RMH Group, a mechanical and electrical engineering and industrial facilities

design firm based in Lakewood, Colorado. He has ten years of experience designing high-performance mechanical systems for institutional and commercial projects. Jeff's engineering background includes analysis and design of HVAC systems, process systems, and piping systems for healthcare facilities, higher education campuses, and office buildings, among many others. Jeff received his Bachelor of Science degree in mechanical engineering from Colorado State University in 2003.

9:00 – 9:55: Healthcare Codes and Standards

ASHRAE Standard 170 is the most prevalent design guideline for ventilation in healthcare facilities (ANSI/ASHRAE/ASHE Approved). The last update was the 2008 issue, though multiple addendums have been issued since. Standard 170 was also incorporated into the 2010 edition of the FGI Guidelines. The ever changing healthcare environment and the continued maintenance of Standard 170 require constant attention to remain current on the topic. This topic discussion will primarily cover the current 170 Standard, the FGI Guidelines and some relevant NFPA codes and standards.

Speaker: Mark Jelinske, P.E., Senior Associate; Cator Ruma & Assoc., Co.

Mark joined Cator, Ruma and Associates in 1996 and serves as a Senior Associate. His expertise ranges across several industries with a strong focus in healthcare. Mark is a professional engineer in Colorado and has been certified by the American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) as a Healthcare Facility Design Professional. He has conducted workshops at previous ASHRAE Technical Conferences on mechanical and HVAC code issues comparing the International Codes and current codes. He has served as a member of the City and County of Denver Mechanical and Gas Code Committee. He is called upon by his peers on many occasions to assist with code interpretation.

Mark has 27 years of experience and has a Bachelor of Science in Mechanical Engineering from the University of Missouri, Rolla.

10:10 – 11:05: Construction Challenges / Best Practices for Hospitals

This presentation will focus on discussing issues surrounding mechanical design and construction from multiple perspectives in the contractor hierarchy, from the general contractor level, the mechanical contractor level and the design level.

Speaker: Joe Hanlin, Healthcare Operations Manager, Senior Project Manager, MBA; Haselden Construction, Joe is the Healthcare Operations Manager for Haselden Construction. He has a BS in Civil Engineering and an MBA in Management from CU Boulder. He has over 23 years of experience as a G.C., and has been with Haselden for almost 19 years. Joe is currently the lead Senior Project Manager for the University of Colorado Hospital.

Speaker: Dan Strait, P.E., Vice President, Project Development; US Engineering

Dan is Vice President of Project Development at U.S. Engineering Company overseeing Marketing, Preconstruction, and Estimating services and has been with the company for 14 years. Dan has 20 years of experience in the industry in construction and design in a wide range of healthcare facilities. He has experience with the design and construction of 8 local ground up hospitals and experience with numerous additions and renovations in healthcare. He earned his Bachelor's degree in Architectural Engineering from the University of Wyoming. He is a member of Colorado Association of Healthcare Engineers and Directors (CAHED) as well as ASHRAE.

Speaker: Alex Infante, PE, The RMH Group, Inc.

Alejandro Infante, P.E., is a senior mechanical engineer at The RMH Group, a mechanical and electrical consulting engineering firm based in Lakewood, Colorado. Alex has more than 20 years of experience creating engineered designs and studies for a variety of facilities in the healthcare, higher education, technology, and commercial sectors. His experience includes project management and mechanical design for more than 35 new or renovated healthcare facilities. Alex and earned his Bachelor of Science degree in mechanical engineering from the University of Texas at Austin. He is a member of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) and the Colorado Association of Healthcare Engineers and Directors (CAHED).

Moderator: Steve Ferguson, Air Purification

Steve Ferguson is currently a Sales Engineer with Air Purification Company. Steve was a designer for 10 years with ME Engineers and Newcomb and Boyd. He moved back to Colorado in 2008 and became a Sales Engineer with JCI. He has been with Air Purification Company for about 2 years. Steve received his Bachelor's degree in Mechanical Engineering from Ohio State University.

1:35 – 2:30: Humidification in Healthcare Facilities

Humidification is a critical component to healthcare HVAC systems. This presentation will cover some basic fundamentals of humidification and its application in the healthcare environment. This will include the different ways to administer humidification to the space and the spaces that require it. It will also include examples to portray best practices and possible pitfalls, especially in a climate such as Colorado and Wyoming.

Speaker: Jason Strauss

Jason is the Co-founder of NEP Ltd, and has been with the company since 1976. He is currently a Director/Owner at both NEP Inc and Nepron. He is also the Western Regional Manager for Nepron.

2:35 – 3:30: Healthcare Short Set Vertical Turbine Pump Applications and Design

Vertical multistage turbine pump application for sump design in cooling tower applications. Course topic will consist of information regarding pump intake placement as associated to multiple pump installations in a sump or wet well. Information provided will be in accordance with the Hydraulic Institute section 9.8 recommendations for Rotodynamic Pumps for Pump Intake Design.

Health care facilities require water pumps for chilled water plants. Pumps are sized to pick up cool water from the low point of the tower collection basin and pump cool water through the plant cooling system. Single or multiple staged vertical turbine type pumps are recommended as an economical choice compared to pumps that must maintain a suction lift to operate efficiently.

Speaker: David Stover

David Stover started in the water industry 1979 in Yuma Arizona. Working as a contractor he gained practical field experience in water wells, pumps, system design, sales and service. In 1996 he accepted a position as distribution sales for the state of Arizona of residential water systems products. In 1998 he relocated to Atlanta Georgia when he accepted a position as the manufacturer's sales representative of turbine pumps for the Southeast United States where he spent 5 years working a 10 state territory selling Submersible and Lineshaft Turbine pumps. In 2003 he accepted a position at ITT Industries as the Southeast Territory Sales Manager for Red Jacket Water Products. In 2004 he accepted the appointment of Market Development Manager for Turbine Products in the Southeast Region. In this position he provided support for turbine products for Goulds Pumps. In 2006 he held the position of Sr. Territory Sales Manager for the state of Georgia working with distributors and dealers of Goulds Pumps and Red Jacket Water Products. In 2009 was placed as Market Development Manager for Agricultural Irrigation products for the Eastern United States serving the Ag-Irrigation markets. In 2011 David was assigned to Xylem's North Americas' region for turbine products covering United States, Canada and parts of Mexico. Today David works the sales team, application engineers and marketing department for Goulds Water Technologies Texas Turbine Operations and is the National Trainer for Turbine Product conducting schools across the United States, Canada and Mexico.



ROCKY MOUNTAIN CHAPTER OF AMERICAN SOCIETY OF HEATING, REFRIGERATION & AIR-CONDITIONING ENGINEERS

22nd Annual Technical Conference

Certificate of Attendance

Sponsored by the Rocky Mountain Chapter of ASHRAE
May 2, 2014




&R Fundamentals


HVAC Systems & Applications


Sustainability

Building Automation


Healthcare

8:00 - 8:55
 **Altitude Effects on System Design**
 Michael Haughey, Silvertip Engineering


 **Fan System Effect and Fan Efficiency Grade**
 Matt Spink, Greenheck Fan Corp

 **How LEEDv4 Impacts Energy Professionals and Mirrors Broader Sustainability Trends**
 Dan Leblanc, YR&G


 **DDC Basics**
 Dave Kahn, The RMH Group, Inc.


 **Ventilation vs Energy in Healthcare**
 Jeff Elsner, The RMH Group, Inc.

9:00 - 9:55
 **Filtration for Cooling Towers and Evaporative Condensers**
 Dennis Jamison, Puroflux Corporation


 **Sustainable Kitchen Design**
 Richard Jones, National Engineering LTD


 **Energy Efficient Control Sequences**
 Steve Nixon, Johnson Controls Inc.


 **Healthcare Codes and Standards**
 Mark Jelinske, Cator Ruma & Assoc. Co


10:10 - 11:05
 **Trouble-free Methods of Applying Evaporative Cooling for Energy Conservation**
 Rick Phillips, The RMH Group, Inc.

 **Shop HVAC Applications - Dust, Welding, and Automotive Exhaust**
 Mike Siros, AQC

 **Systems Integration/Interfacing with Packaged Equipment**
 Cory Knopp, Setpoint Systems

 **Panel on Construction Challenges/ Best Practices for Hospitals**
 Joe Hanlin, Haselden Construction
 Dan Strait, US Engineering
 Alex Infante, The RMH Group, Inc.
 Steve Ferguson, Air Purification

Lunch
 **Keynote Speaker: ASHRAE and Climate Change Science**
 Tom Workema, ASHRAE Vice-President


 **Tips for Design and Construction of High Quality Buildings**
 Pieter van der Mersch, ECO Associates


 **How to Best Design / Install / Commission BAS**
 Pat Lester, University of Colorado
 Joe Ellison, Saunders Construction
 Ira Goldschmidt, Goldschmidt Engr. Solutions
 Ken Nekvasil, ATS RM

 **Humidification in Healthcare Facilities**
 Jason Strauss, Nepronic LTD

1:35 - 2:30
 **Fan Fundamentals**
 Ryan Johnson, Twin City Fans

 **AHRI 1060 Certification Program for Air-to-Air Heat Exchangers**
 Blake Erb, Venmar CES

 **BAS in the Cloud**
 Jon DeRidder, Enabled Energy
 Ken Nekvasil, ATS RM


 **Healthcare Short Set Vertical Turbine Applications and Design**
 David Stover, Xylem Inc.


2:35 - 3:30
 **Load Calculations**
 Mike Brandemeuhl, University of Colorado


 **What Energy Modeling Is, and what it is Not: A Realistic Expectation of Energy**
 Rebecca Reel, The RMH Group, Inc.
 Sean Bellman, BCER
 Peter Ellis, Big Ladder Software
 Sue Reilly, Group 14


 **How to Best Design / Install / Commission BAS**
 Pat Lester, University of Colorado
 Joe Ellison, Saunders Construction
 Ira Goldschmidt, Goldschmidt Engr. Solutions
 Ken Nekvasil, ATS RM


 **Humidification in Healthcare Facilities**
 Jason Strauss, Nepronic LTD


3:35 - 4:30
 **ASHRAE Standard 90.1**
 Sean Bellman, BCER

 **Professional Development Hours Awarded**

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 **ACAC R.C.s, (Recertification Credits) Awarded**

 **ABIH CM Points (Continuing Maintenance Points) Awarded**

 **Signature of Participant**

 Signature of Chapter Officer

REGISTRATION INFORMATION

22nd Annual Technical Conference
Friday, May 2, 2014
Sheraton Hotel Denver West – 360 Union Boulevard, Lakewood CO 80228

“Shaping the Next”

Presented by:
The ASHRAE Rocky Mountain Chapter

Register by April 18th, 2014 to ensure space availability.
Payments received after April 18th or walk-ins the day of the seminar will be accommodated pending space availability.

REGISTRATION AVAILABLE AT
WWW.ROCKYMTNASHRAE.COM

Membership Prices (before April 18):

\$175 Full day Conference (includes 6 seminars, lunch and keynote presentation)
\$125 Half day Conference (includes 3 seminars, lunch and keynote presentation)
Volume discount - 10% Discount for registering 5+ members

Non-member prices:

\$200 Full day Conference (includes 6 seminars, lunch and keynote presentation)
\$150 Half day Conference (includes 3 seminars, lunch and keynote presentation)
Volume discount - 10% Discount for registering 5+ members

Keynote speaker and Lunch Tickets:

\$50 for Keynote Presentation (ASHRAE Society VP Tom Workema) and lunch

All proceeds go toward ASHRAE Research and ASRHAE Endowed Research

For questions please contact:
Jessie Jones, 303-312-4641 or TechConference@rockymtnashrae.com