

Technical Session Presentations
Track 1 - Morning

Integrated Building Design

Time: 8:15AM – 9:45AM

By: Charles E. Gullede, III, PE, HFDP

GBCI Approved | 1.5 CE Hours | 0090010495

AIA Approved | 1.5 LU/HSW | GULLEDGE01

This seminar will provide a working knowledge of the integrated building design process, explaining the basic concepts involved and outlining the fundamental application of this approach. Course content will explain the advantages and benefits of integrated building design and how this process differs from conventional design practice. The program structure will identify the necessary sequencing and scope of activities that should be implemented to support development of collaborative solutions. In addition to design related philosophy, course content will explore the critical elements of TEAM activity and management of collaborative teams. This seminar will benefit any person who has a role in the planning, design, construction, and operation of a built solution. Attendees will be able to strategically position themselves in the market place by understanding the value of project fundamentals and the importance of holistic interdependencies. Emphasis will be placed on transitioning traditional processes that aggregate isolated silos of knowledge into collaborative thought and shared outcome.

Integrating Indoor Air Quality and Energy Efficiency in Buildings

Time: 10:00AM – 11:30AM

By: William P. Bahnfleth, Ph.D, PE

GBCI Approved | 1 CE Hour | 0920002624

AIA Approved | 1 LU/HSW | BAHNFLETH02

Buildings are one of the largest energy end use sectors in countries around the globe. Concerns for the availability of energy supplies and the impact of energy use on the environment are driving a worldwide focus on energy end use reduction. In this push for dramatic changes in the energy use intensity of the building sector, it is essential that the fundamental importance of indoor environmental quality, particularly indoor air quality, not be lost. This presentation addresses: 1) the significance of indoor air quality in terms of its impact on health and productivity and associated costs; 2) the inseparable linkage between indoor air quality and building energy demands, including examples of efficient technologies for maintaining good indoor air quality; and 3) the need for an approach to building research, design, and operation that recognizes this connection.

LUNCH

Box Lunches will be provided for all Technical Session Attendees from 12:00Noon to 1:00PM

Technical Session Presentations
Track 1 - Afternoon

Standard 188 – Legionellosis: Risk Management for Building Water Systems

Time: 1:30PM – 3:00PM

By: Thomas E. Watson, P.E.

Background and history of legionellosis also known as LD (Legionnaires disease,) LB (Legionella Bacteria) is common but was unknown as the source of Pontiac Fever and LD until 1976. The conditions in building water systems that cause the amplification of LB, the generation of the necessary aerosols containing LB and the susceptible person who are at risk for contracting LD are detailed. The ANSI/ASHRAE standards development process where all interested and affected parties are encouraged to participate through the consensus process is described. The requirement of balance between the various interest groups such as water treatment specialists, building owners and operators, manufacturers of water system devices, government officials, the CDC, and others from around the world is a key. How individuals can participate in improving the standard is another subject that is discussed. The key parts of ANSI/ASHRAE Standard 188-2015 are summarized to give the audience a conceptual framework and sources of more in depth knowledge are given. Compliance requirements, health care facility requirements, the necessary building survey to assess the risk of LD, the key elements of a WMP (water management plan), control points, and the verification and validation requirements. The design, documentation, operation & maintenance of building water systems by the program team of knowledgeable persons is stressed.

HVAC and Airborne Infectious Diseases

Time: 3:15PM – 4:45PM

By: William P. Bahnfleth, Ph.D, PE

GBCI Approved | 1 CE Hour | 0920005385

AIA Approved | 1 LU/HSW | BAHNFLETH06

Concern regarding the risk of hospital acquired infections and the effect of the built environment on epidemics of drug-resistant diseases is increasing. The well-educated designer and owner needs to understand the mechanisms by which infectious disease is transmitted indoors, the extent to which HVAC system characteristics affect probability of infection, available means for controlling risk with demonstrated effectiveness. These topics are presented and discussed using the ASHRAE Board of Directors-approved Position Document Airborne Infectious Diseases as a framework. Pertinent scientific knowledge about modes of disease transmission is reviewed, its practical implications for control are discussed, and the three HVAC-related control methods identified by the Position Document: ventilation, particulate filtration, and ultraviolet germicidal irradiation, are presented and compared. General recommendations for reducing risk are provided and knowledge gaps that need to be filled are identified.

PDH

PDH Certificates will be available for all Technical Session Attendees, a total of 6 PDH are possible

The Philadelphia Chapter

**Welcomes you to
ASHRAE Region III CRC16
Technical Session**

**Track 1
August 18, 2016**



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Philadelphia
Pittsburgh
Richmond
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Charles E. Gulledge, III, PE

A C Corporation, Greensboro, NC

Chuck Gulledge, P.E., HBDP, is senior mechanical engineer, AC Corporation, Greensboro, N.C. As a vice president, Gulledge is a member of the Board of Directors and the Executive Committee and serves as chair of Publishing and Education Council. He formerly served on the Board as a vice president in 2014-15 and a director at large. Gulledge started his career in HVAC over 30 years ago as an engineer-in-training with Parsons Brinckerhoff Quade & Douglas working on transit system infrastructure, vehicular tunnels and moveable swing-span bridges. He has served the built world in the roles of a consulting engineer, municipal owner and design-build contractor. Gulledge is currently registered as a professional engineer in the states of North Carolina, Georgia, Kentucky, South Carolina, Alabama and Virginia.

Gulledge's comprehensive design, construction and operational portfolio covers transportation, commercial, educational, institutional, lodging, mission critical, life sciences, healthcare, pharmaceutical, manufacturing, industrial, archival, historical and hospitality. Significant projects in which Gulledge was involved include the North Carolina State Bureau of Investigation Forensics Laboratory; the Caterpillar Axle Manufacturing Plant and Mini-Excavator/Tractor Assembly Plant; the Greensboro Coliseum Complex, 911 Communication Center, and Water Resources – Police – Fire Operations Center; the Harland Clarke check production facility; the University of North Carolina at Wilmington Student Center and Central Energy Plant; East Carolina University Minges Coliseum Complex and College Hill Residence Hall; the Guilford Technical Community College Adult Education Center, Public Safety Training Center, Applied Technology Center, and Hospitality Management Center; Siecor Corporation Cable Plant; and the Baltimore Harbor Tunnel renovations.

Gulledge has served as past chair of the ASHRAE 2011 Energy Modeling Conference, the Chapter Technology Transfer Committee (CTTC) and Technical Committee 7.1, Integrated Building Design. He has served as member of the Handbook Committee, CTTC-regional vice chair for Region IV and president of the North Piedmont Chapter. He served as the ASHRAE Liaison to the Construction Specifications Institute (CSI). In his role as the liaison to CSI, Mr. Gulledge was intimately involved in the overhaul of the *MasterFormat* 2004 (MF04) specification organization structure. He remains a *MasterFormat* Accredited Instructor for CSI. Gulledge has presented multiple presentations on the Integrated Design Topic as an ASHRAE Distinguished Lecturer and an ASHRAE Learning Institute (ALI) Instructor. He has provided outsourced ALI instruction to organizations such as the New York City Transit Authority and NAVFAC. Additionally, he participated as a speaker for the ASHRAE Satellite Broadcast on Integrated Building Design. He is the recipient of an Exceptional Service Award, a Distinguished Service Award, Chapter Service Award, Regional Award of Merit and the Dan Mills Technology Award. Gulledge received his Bachelor of Science in mechanical engineering from North Carolina State University.

William P. Bahnfleth, Ph. D., P.E.

Pennsylvania State University, College Park, PA

Dr. Bahnfleth is Professor and Director of the Indoor Environment Center in the Department of Architectural Engineering at the Pennsylvania State University (Penn State) in University Park, PA, where he has been employed since 1994. Previously, he was a Senior Consultant for ZBA, Inc. in Cincinnati, OH and a Principal Investigator at the U.S. Army Construction Engineering Research Laboratory in Champaign, IL. He holds BS, MS, and PhD degrees in Mechanical Engineering from the University of Illinois, where he also earned an undergraduate degree in music (pipe organ performance), and is a registered professional engineer.

At Penn State, Dr. Bahnfleth teaches undergraduate courses in HVAC fundamentals and controls and graduate courses in chilled water systems, hot water and steam systems, and indoor air quality. His research interests cover a wide variety of indoor environmental control topics, including chilled water pumping systems, stratified thermal energy storage, protection of building occupants from indoor bioaerosol releases, ultraviolet germicidal irradiation systems, and others. He is the author or co-author of more than 150 technical papers and 13 books and book chapters. He consults on the design of chilled water thermal energy storage systems and has been involved in more than 20 projects world-wide.

Dr. Bahnfleth is a fellow of both ASHRAE and the American Society of Mechanical Engineers (ASME) and is also a member of the International Society for Indoor Air Quality and Climate (ISIAQ), the International Building Performance Simulation Association (IBPSA), Sigma Xi, the American Society for Engineering Education (ASEE), and the Society of Building Science Educators (SBSE). He has served ASHRAE in a variety of capacities, including Student Branch Advisor, Chapter Governor, Technical Committee and Standing Committee Chair, and as Director-at-Large, Vice President, Treasurer, and 2013-14 Society President. He is the recipient of a 1st place ASHRAE Technology Award, Transactions Paper Award, and Distinguished Service and Exceptional Service Awards.

Thomas E. Watson

Daikin Applied, Staunton, VA

Mr. Watson is now the director of the Daikin Learning Institute after spending over 44 years in engineering design of air conditioning equipment. He recently was the chief engineer at Daikin Applied responsible for new product development for factories in North America, Europe and Asia. He was in charge of the development of the first centrifugal chiller using a zero ozone depleting refrigerant and the first magnetic bearing high efficiency products in the air conditioning industry. He is the holder of five patents related to air conditioning equipment.

He is a former ASHRAE Society president, a global society of over 55,000 members in 147 countries. For the past two years he has been the chair of the standards project committee that developed the first American National Standard that deals with the management for building water systems to reduce the risk of legionellosis. He is now leading several international committees in the introduction of very low global warming refrigerants.

He was presented the 2016 F. Paul Anderson Award by ASHRAE in January. The F. Paul Anderson Award is the Society's highest technical award.

Technical Session Presentations Track 2 - Morning

Controls and Ventilation Design Considerations for VRF

Time: 8:15AM – 11:30AM

By: Tom Greco and Joe Cefaly of Mitsubishi

This presentation will discuss the three aspects of variable refrigerant flow (VRF) HVAC equipment operation and design considerations. We will discuss the refrigeration cycle in terms of how VRF condensing units operate. Emphasis will be made on how to interpret the pressure-enthalpy chart when designing VRF systems in general. Ventilation design as it relates to projects using VRF systems will be explored. Course content will cover different methods for introducing ventilation air to buildings including using VRF equipment to treat the air directly, use of energy recovery ventilators and dedicated outside air systems. The ventilation strategies of having ventilation air being delivered to spaces independent from, and integral to, VRF systems will be presented. Demand controlled ventilation will also be discussed. Considerations for designing control strategies as they relate to VRF systems will be reviewed. The primary focus will be on "out of the box solutions" but advanced concepts will also be touched on.

ASHRAE Standard 15 applied to VRF Systems

Time: 8:15AM – 11:30AM

By: Jay Kohler of York JCI

Technical Session Presentations Track 2 - Afternoon

ASHRAE/IES/USGBC Standard 189.1:

Structure, Requirements and Energy Savings

Time: 1:30PM – 3:00PM

By: Dr. Drury Crawley of Bentley Systems

Standard 189.1, Standard for the Design of High-Performance, Green Buildings except Low-Rise Residential Buildings, is the first code-intended commercial green building standard in the United States. It provides a long-needed green building foundation for those who strive to design, build, and operate green buildings. The standard covers key topic areas of site sustainability, water use efficiency, energy efficiency, indoor environmental quality and the building's impact on the atmosphere, materials and resources, and includes construction practices as well as plans for operation of the building after occupancy. This presentation provides an overview of the structure and requirements of Standard 189.1, including key mandatory, prescriptive, and performance requirements. The expected energy savings in comparison to other ASHRAE Standards by commercial building type is also shown.

The Next Generation of Refrigerants

Time: 3:15PM – 4:45PM

By: Matthew Ritter from Arkema

Our industry is constantly evolving and refrigerants are an admired topic as policy measures are driving regulatory changes around the world. At the international level, countries are on the cusp of regulating HFCs while several domestic programs have sprouted to ignite an earlier move to the use of lower GWP substances. All of this activity is pushing up against a number of codes and standards which are not currently prepared to deal with all of the properties of the new substances. Users are left with many new options for their equipment and must consider a host of parameters before selecting their next fluids. The Next Generation of Refrigerants will fly over the global and regional policy dynamics, the new refrigerants coming to market, along with the challenges and opportunities users and ASHRAE faces in the coming years.

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**Track 2
August 18, 2016**



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Tom Greco and Joe Cefaly

Mitsubishi Electric

Tom Greco – Controls Manager, Mitsubishi Electric Cooling and Heating – Northeast Business Unit. Tom is a degreed mechanical engineer with 10 years in the commercial building automation field. Has experience in hardware engineering, field integration, technical sales, commercial sales and has worked directly for two major equipment manufacturers, both conventional HVAC systems and Variable Refrigerant Flow. Currently, Tom heads the controls effort for the Northeast Business Unit of Mitsubishi Electric Heating and Cooling.

Joe Cefaly has worked with Mitsubishi Electric Cooling & Heating for the past 5 years, and was a mechanical engineer before taking on his current role of OEM Applications Manager. With 10 years' experience in the HVAC industry, Cefaly has achieved his LEED AP certificate as well as CEM accreditation.

Jay Kohler

JCI – York

Jay Kohler is Engineering Manager, Director of Technology & Innovation, Chiller Solutions for JOHNSON CONTROLS, INC. / YORK INTERNATIONAL. Director for a group of 12 engineers and technicians in York, PA and Nantes, France responsible for technical advancements in heat transfer, modeling, refrigeration systems, heat pumps and chiller systems. Prior to this at JOHNSON CONTROLS, INC. / York International, Large Tonnage Chillers. He is a past Chairman of ASHRAE SSPC-15, Cognizant committee with responsibility for ANSI/ASHRAE Standard 15, Safety Code for Mechanical Refrigeration. He is a recipient of ASHRAE Distinguished Service Award. He has been very active in ASHRAE as a Member of TAC; Member Standards committee of ASHRAE; Chairperson of Standards subcommittee ILS/ISAS, dealing with Standards intersociety and international issues; Chairman of SPC-182; Chairman of SPC-40; Chairman of TC8.3, Absorption and Heat Operated Machines; ; Member of Designation and Nomenclature Subcommittee of SSPC-34.

Chair of US TAG to ISO TC 86 / SC1, dealing with ISO refrigeration safety code; Invited presenter - Ozone2Climate Technology Road Show and Industry Roundtable – Beijing China - April 2012; Member of the Scientific Committee for the 2005 International Sorption Heat Pump Conference; ASME – Chairman of the Susquehanna Section 1984-85; Part-time instructor at Penn State York Campus 1982-1984. Taught course, Heat Transfer, for Associate Degree program.

Professional Engineer, Registered in Pennsylvania and a Co-Inventor for 4 patents.

Dr. Drury Crawley

Bentley Systems

Dr. Crawley is Director, Building Performance and Bentley Fellow focusing on building performance, energy efficiency, renewable energy and sustainability. Prior to joining Bentley in 2010, Dr. Crawley lead the U S Department of Energy's Commercial Buildings Initiative [working to create cost-effective low-energy buildings nationwide including the Commercial Building Energy Alliances (now Better Buildings Alliance)] and was responsible for initiating the development of EnergyPlus and other DOE energy software. With more than 35 years of experience in buildings energy efficiency, renewable energy, and sustainability, he has worked in engineering software development, government research and standards development organizations, as well as building design and consulting companies. He received his PhD in Mechanical Engineering from University of Strathclyde in Glasgow, Scotland on the topic of building simulation as a policy tool, looking at the potential impacts of climate change on the built environment. He received a Bachelor of Architecture from University of Tennessee and is a registered architect. He is active in ASHRAE (Chair of Standard 169 Weather Data for Building Design Standards, Chair of TC 4.2 Climatic Data, member of the Advocacy Committee, member of SSPC 189.1 Standard for the Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings, member of SSPC 140 Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs, former member of the Technical Activities and Research Administration Committees, and past chair of TCs 2.8, 4.2, 4.7, and 7.1). He was made an ASHRAE Fellow in 2009, achieved the ASHRAE BEMP (Building Energy Modeling Professional) certification in October 2012, received the ASHRAE Exceptional Service Award in 2013, the ASHRAE Research Administration Committee's Service to ASHRAE Research Award in January 2012, the ASHRAE Distinguished Service award in 2003 and a 1999 Symposium Best Paper Award for "Which Weather Data Should You Use for Energy Simulations of Commercial Buildings?" He is also active in IBPSA (board member since 1998, Fellow in 2012, Regional Affiliate Liaison since 2006), IBPSA-USA (board member and treasurer since 2013), AIA, USGBC (former member of the Research Committee and the Energy & Atmosphere TAG), and serves on the editorial boards of three international Journals. He has written more than 125 papers and articles, testified before the U.S. Congress, lectured at more than 20 universities, and made more than 400 presentations on building energy efficiency, sustainability, and renewable energy throughout the world.

Matthew Ritter

Arkema

Matt is a senior business executive who has held a wide variety of roles in the chemical and environmental fields. He started his career as an environmental consultant with McLaren/Hart Environmental Engineering Corporation and has spent the last 20 years with Arkema Inc., a \$9 billion, global specialty chemical firm, leading in roles such as business and commercial management, marketing, procurement, environmental policy, and regulatory compliance. His current role as Director, Government Affairs focuses on advocacy, legal issues, and extensive work within the legislative/regulatory process. Additionally, Matt serves on a number of industry boards representing Arkema and is past Chair of the Refrigeration Committee and past Chair of TC 2.5 Climate Change. Matt holds an MBA and M.S. from St. Joseph's University, and a B.S. from Kutztown University.