

THE HOT AIR DIFFUSER

Chapter Newsletter

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CHAPTER MEETING RECAP

NOVEMBER:

Our November meeting was held on November 13th and was a tour of the Zion Bank Headquarters project at the corner of 8th and Main. This will be the new home for the Zions Bank Headquarters of Idaho, and the Gardner Company which is a real estate company based in Salt Lake City with a regional office in Meridian, ID. Other Occupants of this building are planned, but are unknown at this time. This Building will include 253,000 square feet of retail and office space along with 183 parking spaces connected to an already 396 stall parking garage. other features include: an onsite Health club, 5 high-speed traction elevators, Second floor plaza space with an 8th street Balcony.

Level 1-2: Retail

Level 3-5: Parking

Level 6-16: Office Space

Level 17: "Founders Room" available to the public for meetings and receptions

Level 18 Mechanical Penthouse

http://en.wikipedia.org/wiki/Zions_Bank_Idaho_Headquarters

DECEMBER:

Our December chapter meeting was held on December 11 and was a presentation on netzero buildings by Gaylen Atkinson and Tony Sutton of Atkinson Electronics. Atkinson Electronics was able to achieve 60% better than baseline performance on their new office building in SLC. Gaylen also discussed his efforts to reach net zero on his new home that is currently under construction.



ASHRAE, founded in 1894, is an international organization of some 50,000 persons. ASHRAE fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

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HISTORY LESSON

NOVEMBER

Five Years Ago

The chapter president was Jeff Fulcher. The meeting was held on November 14, 2008, at Bill Willems, Energy Labs, discussed the multi-fan air handling units and their potential downfalls.

Ten Years Ago

The chapter president was Matthew May. The meeting was held on November 14, 2003, at the Sports Zone, second floor of the Grove Hotel. This was a joint seminar with RSES

Twenty Years Ago

The chapter president was Roger Albers. The meeting was held on November 12, 1993, at Edwards Restaurant. Tom Allen, architect, introduced his "Smoke Guard" product/design of an elevator door smoke seal.

Twenty Five Years Ago

The chapter president was Pat House. The meeting was held on Friday, November 11, 1988, at the Kings Table Restaurant. The program was a panel discussion entitled "Contractor Work for Government Agencies Versus Private Sector". The panel members were Tom Zabala, Zabala, Giltzow, & Albanese Architects; George Richardson, Richardson Equipment Company; Doyle Allen, State of Idaho Department of Public Works; Milford Terrell, DeBest Plumbing Company; and Bruce Cleveland, Idaho Power Company, moderator. Larry Jenkins, ASHRAE Region IX Vice President, was a guest at this meeting.

DECEMBER

Five Years Ago

The chapter president was Jeff Fulcher. The meeting was held on December 12, 2008, at Idaho Power. The program was seeing how liquid nitrogen can instantly make ice cream. And samples were had by all.

Ten Years Ago

The chapter president was Matthew May. The meeting was held on December 11, 2003, at the Doubletree Riverside. Mike Purcell, manager of the Building Commissioning Program with the Idaho Energy Division, gave a presentation on results from case studies on buildings in southwestern Idaho that have recently undergone the commissioning process.

Fifteen Years Ago

The chapter president was Brent Robertson. The meeting was held on December 11, 1998, at the Doubletree Riverside. Bill Hawkes and Craig Gappamayer, Yamas Controls, gave a presentation on the Y2K computer date problem and the possible effects on the HVAC industry and building control systems.

Twenty Years Ago

The chapter president was Roger Albers. The meeting was held on December 10, 1993, at Edwards Restaurant. A pre-meeting video was shown titled "ASHRAE Standard 90.1-1989 Reducing Energy & Increasing Quality: Applying Standard 90.1". The meeting program was a slide show "ASHRAE 62: A Protocol For Indoor Air Quality".

Twenty Five Years Ago

The chapter president was Pat House. The meeting was held on Friday, December 9, 1988, at the Kings Table Restaurant. Harlan summers, Public Information Department at Idaho National Engineering Laboratory, gave a presentation on INEL.



ASHRAE/IES Publish 2013 Energy Standard: Changes for Envelope, Lighting, Mechanical Sections

ATLANTA – Major changes to requirements regarding building envelope, lighting, mechanical and the energy cost budget are contained in the newly published energy standard from ASHRAE and IES.

ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, incorporates 110 addenda, reflecting changes made through the public review process. Appendix F gives brief descriptions and publication dates of the addenda to 90.1-2010 reflected in this new edition.

“While many things have changed since the first version of Standard 90 was published in 1975, the need to reduce building energy use and cost has not,” Steve Skalko, chair of the committee that wrote the 2013 standard, said. “This standard represents many advances over the 2010 standard, as we worked toward our goal of making the standard 40 to 50 percent more stringent than the 2004 standard.”

“Achieving the stringency goals established for the 2013 standard presented a challenge in reducing the requirements for lighting,” Rita Harrold, director of technology for the Illuminating Engineering Society of North America, said. “While interior lighting power densities (LPD) were re-evaluated and most lowered, there continues to be an ongoing concern about maintaining quality of lighting installations for occupant satisfaction and comfort while achieving energy savings. The focus in the 2013 standard, therefore, was not just on lowering LPDs but on finding ways to achieve savings by adding more controls and daylighting requirements as well as including lighting limits for exterior applications based on jurisdictional zoning.”

The most significant changes are:

- **Building Envelope.** Opaque elements and fenestration requirements have been revised to increase stringency while maintaining a reasonable level of cost-effectiveness. Opaque and fenestration assemblies in Tables 5.5-1 through 5.5-8 are revised in most climates. These changes include:
 - Criteria requiring double glazed fenestration in many climates
 - Minimum visible transmittance/solar heat gain coefficient (VT/SHGC) ratio to enable good daylighting with minimum solar gain, while not restricting triple- and quadruple-glazing.
 - Simplification of the skylighting criteria.
- **Lighting:** These changes include improvements to daylighting and daylighting controls, space-by-space

lighting power density limits, thresholds for toplighting and revised controls requirements and format.

- **Mechanical:** Equipment efficiencies are increased for heat pumps, packaged terminal air conditioners, single package vertical heat pumps and air conditioners evaporative condensers. Also, fan efficiency requirements are introduced for the first time. Additional provisions address commercial refrigeration equipment, improved controls on heat rejection and boiler equipment, requirements for expanded use of energy recovery, small motor efficiencies and fan power control and credits. Control revision requirements have been added to the standard such as direct digital controls in many applications. Finally, the 2013 edition completes the work that was begun on equipment efficiencies for chillers in the 2010 edition.

- **Energy Cost Budget (ECB) & Modeling:** Improvements were made to the ECB and Appendix G provisions to clarify the use of the prescriptive provisions when performing building energy use modeling. In addition, these sections were revised to enhance capturing daylighting when doing the modeling calculations.

Another important change for the 2013 standard is the first alternate compliance path in Chapter 6. Section 6.6 was added to the 2010 edition to provide a location for alternate methods of compliance with the standard. The first such alternate path has been developed for computer room systems and was formulated with the assistance of ASHRAE technical committee 9.9, Mission Critical Facilities, Data Centers, Technology Spaces and Electronic Equipment. This path uses the Power Usage Effectiveness (PUE) metric established by the datacom industry. This alternate efficiency path format provides a framework that could be considered for other energy using facets of buildings not easily covered in the prescriptive provisions of the standard.

Also new to the standard are requirements for operating escalators and moving walkways at minimum speed per ASME A17.1 when not conveying passengers.

The cost of ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, is 135 (\$115, ASHRAE members). To order, contact ASHRAE Customer Contact Center at 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide), fax 678-539-2129, or visit www.ashrae.org/bookstore.

ASHRAE New York Tech Program Puts Special Focus on Tall Buildings, International Design, Building Performance

ATLANTA—It's only appropriate that in a city known for skyscrapers—home to nearly 600—that the 2014 ASHRAE Winter Conference Technical Program puts a special focus on the design, development and operation of tall buildings when it visits New York City, Jan. 18-22.

"The ASHRAE Technical Program offers a great opportunity to learn from fellow professionals and experts," Jon Cohen, New York Conference program chair, said. "Also, ASHRAE is continuously improving the Conference experience to incorporate additional networking opportunities, in addition to focusing on technical content."

The Technical Program begins Sunday, Jan. 19, and will follow the successful new format introduced earlier in the year at the 2013 Annual Conference: special hour-long interactive sessions with audience participation, followed by a networking coffee break.

The Technical Program features more than 200 sessions and offers dozens of opportunities to earn New York PDHs, AIA LUs and LEED AP credits.

In a nod to New York City, with its instantly recognizable skyline of towering buildings, the Tall Buildings: Performance Meets Policy track looks at opportunities in the design, development and operation of tall and super-tall buildings. The track also presents the measured and measurable use of utilities, envelope (infiltration and exfiltration), building pressure, waste handling, elevators, carbon and adaptive reuse. Sessions of interest include "Is ASHRAE Tall Enough for Tall Buildings?," "Linking Tall Buildings' Energy Use to Tenant Contribution to Economy," and "Life Safety Issues with Tall Buildings." The innovative features in tall buildings offer attendees design ideas for applications in smaller-sized buildings.

Additionally, as New York is a city on the world stage, the International Design track addresses innovative design strategies to meet environmental elements, geography and cultures. Examine "Energy Saving Strategy of Large-Scale University Facilities;" several sessions on "Cutting Edge Japanese Technologies;" "Sustainable Development in Africa;" and "European Union: Practical Benchmarking of HVAC System Energy Efficiency," to name just a few.

Building Information Systems investigates how building control technologies are integrated and used for building management, operation and efficiency. An interesting session of note is "App, App and Away: Enabling Meaningful Work for the Building Professional with the Development of Quality Apps for Smartphones and Tablet Computers," which explores the evolution of apps; the methods for developing and establishing a reliable app to provide an accessible and verifiable way for building professional to solve practical problems; and looks at areas of potential app development.

Hydronic System Design addresses innovative design, system components and research and case studies of their application, including unintended consequences. Sessions include the three part session "Efficient Technologies that are Also Economically Sustainable;" "Hydronic System Acoustics;" and "Energy Efficient Single Pipe Hydronic System Design for Large and Tall Buildings."

The Environmental Health through Indoor Environmental Quality track includes developing, evaluating and predicting optimal indoor environmental conditions, and features case histories, lessons learned and advice to operators and designers about IEQ, as well as disaster recovery in buildings affected by hurricanes and floods. A few of the track offerings include "Indoor Air Environment and Heat Recovery Ventilation in a Passive School Building;" "A Comprehensive Look at Infectious Disease and Air Filtration in Healthcare Facilities: Energy Saving, IAQ Performance, and What Makes You Sick;" and "Lessons Learned from Storm Recovery."

Additional tracks include Building Performance and Commissioning, Systems and Equipment and Fundamentals and Applications.

The Technical Program runs Sunday through Wednesday, Jan. 19-22, at the New York Hilton. Advance registration closes Dec. 31, after which registration fees increase to "onsite" pricing. Register for the Conference at www.ashrae.org/newyork.

The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, runs Jan. 21-23. The Expo, held at the Javits Convention Center, takes place Tuesday, Wednesday, Thursday as opposed to the traditional Monday, Tuesday, Wednesday. More information is available at www.ahrexpo.com.

ASHRAE Publishes 2013 Version of IAQ Standard

ATLANTA – The 2013 version of ASHRAE's indoor air quality standard contains several revisions to help users better meet its requirements.

Newly published, ANSI/ASHRAE Standard 62.1-2013, *Ventilation for Acceptable Indoor Air Quality*, sets minimum ventilation rates and other requirements for commercial and institutional buildings.

The 2013 standard combines the 2010 standard and 10 published addenda to that edition, providing an easy-to-use consolidated standard. Specific information on the contents of each addendum and approval dates for each addendum are included in Informative Appendix J at the end of the standard.

"The 2013 version of Standard 62.1 continues the trend of increasing clarity while adding flexibility," Roger Hedrick, Standard 62.1 committee chair, said. "These changes will allow designers and building operators to meet the requirements of the standard and provide adequate ventilation airflow to occupants while reducing excess ventilation and the associated energy consumption."

The 2013 edition of the standard revises and improves the standard in several ways. A number of changes re-

move inconsistencies within the standard and improve clarity. Significant changes include:

- Table 6-2, Zone Air Distribution Effectiveness is modified to increase the ventilation effectiveness of underfloor air distribution systems that meet certain conditions.
- Requirements for the quality of water used in humidification systems are modified and clarified.
- Building level pressurization requirements were clarified, including adding a definition of “exfiltration.”
- A performance alternative to the prescriptive exhaust rates is added. This approach differs from the Indoor Air Quality Procedure, the existing performance-based method for setting supply ventilation rates, in that monitoring of the concentrations of contaminants of concern is required and provides the basis for control of exhaust flow rates.
- Some changes to the ventilation rates and space types in Table 6-1 are made. These add refrigerated warehouses and change the ventilation rate for sports related spaces to include a per occupant component which then allows the use of demand controlled ventilation in these spaces.
- The filtration requirement on air entering wetted cooling coils has been modified to change the MERV rating from 6 to 8. This change will reduce potential for particulate deposition on the coils that could lead to biological or other contamination on the coils.
- Toilet exhaust air that is cleaned to Class 1 may be recirculated.

The cost of ANSI/ASHRAE Standard 62.1-2013, *Ventilation for Acceptable Indoor Air Quality*, is \$79 (\$67 ASHRAE members). To order, contact ASHRAE Customer Contact Center at 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide), fax 678-539-2129, or visit www.ashrae.org/bookstore.

Building Energy Disclosure Session Offered by ASHRAE at AHR Expo

ATLANTA – Disclosure requirements and transparency through programs such as fuel efficiency in automobiles and calorie labeling in restaurants have been shown to shift producer and consumer behavior.

The same principles are also being applied to building energy use, where energy use reporting and open data impact market behavior and drive energy efficiency. The implications of the growing trend in disclosure policies are examined in a free session offered by ASHRAE at the 2014 AHR Expo.

ASHRAE's 2014 Winter Conference takes place Jan. 18-22, 2014, New York City, N.Y. Held in conjunction with the 2014 Winter Conference is the International Air-Conditioning, Heating, Refrigerating Exposition, Jan.

21-23, 2014.

ASHRAE's AHR Expo Session, “Trends in Building Energy Disclosure: Increasing Energy Efficiency without Retrofits,” takes place from 3-4 p.m., Tuesday, Jan. 21, in the South Concourse, second level. No badge or ticket required. Attendees will earn 1 NY PDH, 1 AIA Learning Unit and 1 LEED AP credit.

Energy disclosure requirements, now required in seven U.S. cities and numerous European Union countries, require periodic reporting of energy consumption for certain buildings.

“The speakers will tackle the issue of building energy use on the large scale and what major cities are doing about it,” Mike Eardley, P.E., seminar chair, said. “A cost effective solution is not major construction and new efficient equipment, but tuning up existing HVAC&R systems and verifying they are operating correctly. Occupant behavior also has a major impact. Attendees will learn the energy penalties associated with these issues. We also will discuss how city level energy disclosure requirements take a necessary first step in communicating energy use information in buildings so that corrective action can be taken.”

The seminar presents a new energy benchmarking model to support comparative energy performance evaluation across commercial buildings.

The study analyzes patterns of energy consumption across New York City buildings and models the determinants of building energy efficiency to establish a robust model for normalization across multiple characteristics. Energy efficiency has traditionally been achieved through physical retrofits. An alternative approach is presented that harnesses data from smart meters in an eco-informatic system and provides feedback to building occupants on their energy consumption.

Eardley said use of eco-informatic/eco-feedback systems offer a mechanism to close the feedback loop between occupants and energy consumption. Reductions of 5 to 15 percent have been noted with such systems.

“Most importantly, the use of such systems has been shown to be extremely cost effective in comparison with other energy efficiency initiatives,” he said.

Presentations are:

- “Building a Better Benchmark: Lessons from New York City's Local Law 84 Energy Disclosure Data,” Constantine Kontokosta, Ph.D., P.E., NYU Center for the Sustainable Built Environment, New York, N.Y.

“Encouraging Energy Efficient Behavior of Building Occupants through Contextualized Feedback and Social Network Dynamics,” Rishie Jain, Ph.D., NYU Center for Urban Science and Progress, Brooklyn, N.Y.

ASHRAE, IAQA Sign Memorandum of

Understanding

ATLANTA – Through a memorandum of understanding, ASHRAE and the Indoor Air Quality Association (IAQA) are working together to promote better indoor air quality in the built environment.

The agreement was signed on Oct. 15, 2013, during ASHRAE's IAQ 2013 Conference held in Vancouver, British Columbia, Canada.

The agreement commits ASHRAE and IAQA to working together in the areas of consistent leadership communication, chapter collaboration, advocacy, technical activities coordination and research.

"As professionals responsible for environmental control of buildings and transportation systems, our first priority must be making those environments safe, healthy, productive and comfortable," ASHRAE President William "Bill" Bahnfleth said. "This partnership between ASHRAE, a worldwide organization with a scope to broadly promote the arts and science of HVAC&R and allied arts and science for the benefit of the general public, and IAQA, an organization focused on services to ensure good indoor air quality, will enhance the ability of both to achieve their shared goals. We welcome the opportunity to combine the resources of ASHRAE with the expertise of IAQA to strengthen our effectiveness in this critical area."

"This agreement is a great step forward for IAQA and the indoor air quality field. ASHRAE and IAQA have agreed to work closely on issues that are of mutual interest," Donald M. Weekes, CIH, CSP, IAQA President, said. "I am personally looking forward to working with ASHRAE in the coming year."

Founded in 1998, the Indoor Air Quality Association (IAQA) is dedicated to bringing practitioners together to prevent and solve indoor environmental problems for the benefit of customers and the public.

ASHRAE 2014 Winter

Learn More about Requirements of 2013 ASHRAE Standards at Learning Institute Courses

ATLANTA – With new versions of ASHRAE's energy, indoor air quality and thermal comfort standards being published this year, users face new requirements.

Courses addressing the updates in those standards are featured at ASHRAE's 2014 Winter Conference, Jan. 18-22, at the New York Hilton, New York, N.Y. The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, runs Jan. 21-23, www.ahrexpo.com. The Expo, held at the Javits Convention Center, takes place Tuesday, Wednesday and Thursday as opposed to the traditional Monday, Tuesday and Wednesday.

For complete Conference information and to register,

visit www.ashrae.org/newyork.

Twenty-three Professional Development Seminars and Short Courses are being offered by the ASHRAE Learning Institute.

Of special interest are courses related to ANSI/ASHRAE Standard 62.1-2013, *Ventilation for Acceptable Indoor Air Quality*, and ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, both of which were recently published, along with the soon-to-be-published Standard 55-2013, *Thermal Environmental Conditions for Human Occupancy*.

"Throughout the HVAC&R and building construction industries, ASHRAE is the source of knowledge for energy efficiency, indoor air quality and thermal comfort in the built environment," Hugh McMillan, chair of the ASHRAE's Professional Development Committee, said. "ASHRAE publishes standards that establish baselines used to measure performance of buildings in those areas. As our knowledge base evolves, our standards must also evolve to reset the baseline. So that our members and others can stay abreast of the latest developments in this knowledge base, we offer courses in the application of these standards that allow those who attend to apply the latest developments to the design and construction of their projects."

More information about the courses can be found at www.ashrae.org/newyorkcourses.

Also in New York, ASHRAE launches its new Career Enhancement Curriculum. These curricula offer tracks of courses in Energy Savings (ES) Practices and IAQ Practices. More can be learned about this new program by visiting our website at www.ashrae.org/careerpath.

Saturday, Jan, 18, 2014

- NEW! Commercial Building Energy Audits, 8 a.m.-3 p.m.
- Healthcare Facilities: Best Practice Design and Applications, 8 a.m.-3 p.m.
- NEW! Electric Rates, Rules and Regulations, 12 p.m.-3 p.m.

Sunday, Jan. 19, 2014

- Air-to-Air Energy Recovery Applications: Best Practices, 2 p.m.-5 p.m.
- Laboratory Design: The Basics and Beyond, 2 p.m.-5 p.m.
- Mathematical Optimization Techniques and their Applications to HVAC&R Systems and Components, 2 p.m.-5 p.m.

Monday, Jan. 20, 2014

- Combined Heat and Power: Design through Operations, 8:30 a.m.-11:30 a.m.

- High-Performance Building Design: Applications and Future Trends, 8:30 a.m.-11:30 a.m.
- NEW! IAQ Best Practices for Design, Construction and Commissioning, 8:30 a.m.-11:30 a.m.
- Commissioning for High-Performance Buildings, 2:45 p.m.-5:45 p.m.
- NEW! Designing High-Performance Healthcare Facilities, 2:45 p.m.-5:45 p.m.
- NEW! Exceeding Standard 90.1-2013 to Meet LEED Requirements, 2:45 p.m.-5:45 p.m.

Tuesday, Jan. 21, 2014

- Energy Modeling Best Practices and Applications (Co-sponsored by IBPSA-USA and Rocky Mountain Institute), 9 a.m.-4 p.m.
- NEW! Significant Changes to Standard 90.1-2010 and IECC 2012, 9 a.m.-4 p.m.
- NEW! Fundamentals and Applications of Standard 55, 1 p.m.-4 p.m.
- NEW! Design of Commercial Ground Source Heat Pumps, 1 p.m.-4 p.m.
- Data Center Energy Efficiency, 1 p.m.-4 p.m.

Wednesday, Jan. 22, 2014

- Effective Energy Management in New and Existing Buildings, 9 a.m.-4 p.m.
- NEW! Application of Standard 62.1-2013: Multiple Spaces Equations and Spreadsheets, 9 a.m.-12 p.m.
- Troubleshooting Humidity Control Problems, 1 p.m.-4 p.m.

Thursday, Jan. 23, 2014

- NEW! Complying with Standard 90.1-2013, 8 a.m.-3 p.m.
- Operations and Maintenance of High-Performance Buildings, 8 a.m.-3 p.m.

NEW! Introduction to Building Enclosure Commissioning, (Co-sponsored by Building Enclosure Commissioning Collaborative), 8 a.m.-3 p.m.

2014 Winter Conference

ASHRAE Technical Program Reaches for the Sky with Focus on Tall Buildings

ATLANTA – Lessons learned in the design, construction and operation of tall buildings can be applied to buildings of all sizes and stories.

A mini-conference on tall buildings is featured in the Technical Program at ASHRAE's 2014 Winter Conference, Jan. 18-22, at the New York Hilton, New York,

N.Y. The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, runs Jan. 21-23, www.ahrexpo.com. The Expo, held at the Javits Convention Center, takes place Tuesday, Wednesday and Thursday as opposed to the traditional Monday, Tuesday and Wednesday.

For complete Conference information and to register, visit www.ashrae.org/newyork.

"What better place to showcase tall building design than in New York," Jon Cohen, New York Conference program chair, said. "Designing buildings with contingencies for natural disasters will benefit engineers worldwide. We should learn from how buildings respond to the disasters, and use this information to our advantage to save lives and infrastructure in the future. Environmental quality in buildings isn't just a health concern, it's a concern of the conscience. We need to do everything to ensure healthy work environments and living situations while considering the broader environmental impact."

Sessions specific to tall buildings include:

- Is ASHRAE Tall Enough for Tall Buildings?, Sunday, Jan. 19
- Linking Tall Buildings' Energy Use to Tenant Contribution to Economy, Sunday, Jan. 19
- Life Safety Issues with Tall Buildings, Tuesday, Jan. 21
- Natural Ventilation for Tall Buildings, Tuesday, Jan. 21
- Current Trends in Tall Building Designs, Tuesday, Jan. 21
- Specific Engineering Solutions for Tall Buildings, Tuesday, Jan. 21
- ASHRAE and Tall Buildings, Tuesday, Jan. 21
- Trends in Building Energy Disclosure: Increasing Energy Efficiency without Retrofits, Tuesday, Jan. 21 (AHR Expo session)
- Fire Safety Concern for Supertall Buildings, Wednesday, Jan. 22

Data Center Control and Fire Safety in Tall Buildings, Wednesday, Jan. 22

ASHRAE Joins Effort to Promote Better Prepared Workforce

ATLANTA – ASHRAE has accepted an invitation from the U.S. Department of Energy (DOE) to join an effort that will improve building performance through a better prepared workforce. The goal is to advance the skill sets of engineers and other professionals involved in building design, operation and commissioning.

Under DOE leadership, a Board of Advisors has been created for the Commercial Workforce Credentialing Council (CWCC). This Board will be led by the National Institute of Building Sciences (NIBS) with the participation of ASHRAE and other credentialing and professional development organizations. They will work to establish a set of voluntary national guidelines to improve the quality and consistency of commercial building workforce credentials.

The *Better Buildings Workforce Guidelines* will reduce the confusion and uncertainty around workforce credentialing; lower costs; and support better credentials, better workers and better buildings. The *Guidelines* will set an industry-validated Job Task Analysis (JTA) for each job title, as well as certification schemes (blueprints) and learning objectives for training programs.

Initially the *Guidelines* will address commercial building workforce training and certification programs for five key energy-related jobs: energy auditor, commissioning professional, building/operations professional, facility manager and energy manager.

Three of ASHRAE's certification programs are part of this initial development:

- Commissioning Process Management Professional
- Building Energy Assessment Professional
- Operations & Performance Management Professional

Once implemented, industry certification programs must then receive accreditation from the American National Standards Institute (ANSI) in order to be recognized by DOE as meeting voluntary guidelines for the Better Buildings Workforce. This accreditation provides independent verification that the certifications are developed, maintained and administered according to the highest standards of the testing industry. ASHRAE has already begun the process of seeking ANSI accreditation in anticipation of this requirement.

"ASHRAE's involvement in this process is very important," William "Bill" Bahnfleth, ASHRAE president, said. "Participating in the development of the *Guidelines* gives us a voice in how the workforce of our industry will be developed. These *Guidelines* will ensure that quality services are provided by professionals with recognized certifications to increase consumer confidence in the service provided and ultimately to ensure the quality of our future building stock."

ASHRAE representatives recently attended an initial workshop to bring together industry stakeholders; explain the purpose of the newly created CWCC; discuss high-level questions; and provide input into the composition of the subject matter expert committees.

ASHRAE Seeking Comments on Pur-

posed Data Center Energy Standard

ATLANTA—High plug loads and rapidly advancing IT technology make data center applications significantly different from their commercial building counterparts. A purposed standard from ASHRAE that specifically addresses the unique energy requirements of data centers is open for advisory public review.

Standard 90.4P, *Energy Standard for Data Centers and Telecommunications Buildings*, is being developed in response to requests to recognize the energy performance profiles unique to data centers; previously, data centers were included in in ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings*. Standard 90.4P will feature a performance based approach that is more flexible and accommodating of innovative changes which rapidly occur in the data center design, construction and operations, according to chair Ron Jarnagin.

Standard 90.4P is open for advisory public review from Nov. 15-Dec. 30, 2013. For more information, visit www.ashrae.org/publicreviews.

"The explicit needs of data centers drive a fundamentally different approach to regulating minimum efficiency requirements for the electrical and mechanical systems that support the plug loads," Jarnagin said. "By using an approach that requires compliance to a "system" level of performance, designers and end-users can utilize various trade-offs in their optimization strategies depending on their company specific business models."

Also, current industry modeling tools do not possess all the necessary mathematical models to accurately and appropriately model data center HVAC and power design. As a result, demonstrating compliance to the 90.1 Chapter 11 or energy cost budget approaches is not always a practical option. Instead, Standard 90.4P proposes to utilize a performance compliance path known as the Power Utilization Efficiency (PUE) developed by The Green Grid®.

Although there is proposed research for the development of mathematical methods and associated software tools to assist data center designers down the road; compliance with 90.4P is intended to be possible without the use of modeling tools at this time.

Papers Sought for International Conference on Efficient Building Design

ATLANTA – Papers are being sought for a conference focused on research in building design and system technologies for energy efficiency.

Organized by ASHRAE, the American University of Beirut and the ASHRAE Lebanon Chapter, the International Conference on Efficient Building Design: Ma-

terials and HVAC Equipment Technologies, takes place Oct. 2-3, 2014, in Beirut, Lebanon.

Abstracts (400 words in length) are due Jan. 6, 2014. If accepted, papers are due April 14, 2014. Authors of accepted papers are responsible for travel and registration. Hotel accommodations are free for authors presenting papers. Submittal information can be found at www.ashrae.org/Beirut2014.

The Conference presents the latest research and development to improve building designs and state-of-the-art technologies in building materials and systems.

Reducing energy consumption and carbon dioxide emissions, implementing energy efficiency standards and introducing new equipment and technologies are areas seeking improvement in the Arab region, according to Nesreen Ghaddar, conference chair.

"This conference will serve as a platform for presenting advanced research in these topics with the intent to make recommendations for decision makers to implement," she said. "Specifically, direction is sought on what technology is optimal and can be adopted when phasing out HCFC refrigerants in equipment and systems in developing countries."

Topics include but are not limited to:

- Sustainable Building Designs
- Energy Efficiency Standards
- Building Materials
- Indoor Air Quality Systems
- HVAC and Different Technologies
- Solar Heating and Cooling for Built Environment

Systems for Cooling and Water Production for Hot Humid Climates

ASHRAE Announces Technology Award Recipients

ATLANTA – A net zero facility, a historic building, a cheese factory, a residence, a college building and an agriscience farm are being recognized by ASHRAE as innovative buildings.

The ASHRAE Technology Awards recognize outstanding achievements by members who have successfully applied innovative building design. Their designs incorporate ASHRAE standards for effective energy management and indoor air quality. The awards communicate innovative systems design to other ASHRAE members and highlight technological achievements of ASHRAE to others around the world. Winning projects are selected from entries earning regional awards.

First place awards will be presented at the ASHRAE 2014 Winter Conference in New York, N.Y., Jan. 18-22, New York Hilton.

Following are summaries of the winning projects.

Packard Foundation Net Zero Energy Headquarters

Peter Rumsey, P.E., Fellow ASHRAE, chief technology officer, Integral Group, Oakland, Calif., receives first place in the new commercial buildings category for the Packard Foundation Net Zero Energy Headquarters, Los Altos, Calif.

Rumsey also receives the Award of Engineering Excellence, which is given to the most outstanding project receiving a first-place Technology Award. It has only been awarded three other times, in 2000, 2005 and 2012.

The 49,000-square-foot Packard Foundation Headquarters is described as an exemplary ultra-high performance building that is both leading by example and transforming the marketplace. Staying true to the Foundation's prominence in funding conservation, science and environmental causes, the Foundation used its headquarters to demonstrate the full potential of the capabilities of integrated design, innovation in technology and replicable design. In its first year of occupancy it has already served over a thousand visitors in sustainable building education.

Highly efficient systems and an outstanding building envelope provides a reduction in energy demand by 46 percent compared with California Title 24 standards, while the remaining required power is offset with onsite power generation. The project water use goals are to achieve 40 percent water use reduction and implement the capture or infiltration of all rainwater.

The project has raised the bar, becoming the largest certified net zero energy building in the world to date. Success was found through a combination of innovative energy saving strategies, including a nighttime cooling tower with storage tank; a high efficiency air source heat pump boiler with storage; induction diffusers with chilled beams; and a low pressure drop design.

SIERR Building at McKinstry Station

David Budd, P.E., McKinstry, Seattle, Wash., receives first place in the existing commercial building category for the SIERR Building at McKinstry Station, Spokane, Wash. The owner is McKinstry.

Spokane's Inland Empire Railroad (SIERR) Building was built in 1907 as an electric railroad car facility. In the 1950s, the usage shifted to trucking. In October 2010, the facility, which consists of a series of long train car barns with high sloped roofs, was designated a national historical landmark. Today, the 68,000 square foot building serves as a commercial office building. The newly refurbished facility is one of a

handful of high-performing historical buildings in the United States.

Dean Allen, the current owner, discovered the building while searching for a new office location. He fell in love with the building and was determined to restore it to its former grandeur. He also recognized the opportunity to demonstrate how to effectively preserve the nation's building stock by combining innovation in energy efficiency with historic preservation with the belief that the most sustainable building is the one that you preserve.

Through collaboration with the National Park Service, the building is now a model project for many of the new recommended practices described in the recently released Secretary of the Interior's "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings."

Traditional systems design approaches were unable to meet historical preservation requirements and still achieve significant energy savings while creating an office space that was comfortable and unique. To meet these needs, the design team used the following innovative building systems: Hydronic ground source loop; office space/radiant floor system; server room heat recovery; dedicated outside air system; and common areas/constant volume heat pump systems.

Fromagerie des Basques

Gheorghe Mihalache, Ph.D., P.Eng., engineering director, Atis Technologies, Montreal, Quebec, Canada, receives first place in the existing industrial facilities or processes category for Fromagerie des Basques, Trois-Pistoles, Quebec. The owner is Yves Pettigrew, general director, Fromagerie des Basques, Trois-Pistoles, Quebec.

The site Fromagerie des Basques is a family cheese factory founded in 1994. The annual milk transformation is around 3 million liters and the energy sources are oil #2 and electricity. In 2010, a mechanical project was developed to:

- Change the heating and refrigeration of the site.
- Construct a digester to produce biogas from the plant rejections (whey and white waters) and use the biogas in the production and buildings heating.
- Treat the digester effluent to be able to correspond to the environmental standards permitting use of an absorption field.
- Add ventilation (100 percent fresh air) in the cheese production area to ensure a positive pressure and correspond to Canadian Food Inspection Agency regulations.
- Change the High Temperature Short Time to be able to preheat the milk in the pasteurization using the refrigeration heat reject.

- Implement a control system performing survey of the mechanical system, automated control of main production processes, alarms handling and optimization of energy consumption.

One of the biggest concerns was the whey and white water treatment. The factory used to send the whey to a local pork farm but that facility closed and the municipality was unable to treat the entire organic reject. To continue the production, the owner had to invest in a treatment plant. Atis Technologies proposed construction of an anaerobic treatment plant to transform the organic charges of the effluent in biogas (a combination of methane and carbon dioxide) while also using the biogas to produce heat needed in the production.

An existing warehouse was transformed in a mechanical room for the heating, refrigeration and digester infrastructure, and a new building was constructed for the effluent post treatment. The digester conception was the first in the world using a simple head three phase separator, ensuring a uniform velocity which is an essential condition for digester efficiency and non contamination with annoying bacteria.

The vision of the project was to create proper conditions for the production respecting all sanitary regulations for ventilation, minimize all necessary energy for the production, use of proper temperature level for heating and cooling, separate the mechanical infrastructure from the production, make the site able to handle the effluent treatment by transforming it into a valuable combustible for the production. After functioning more than one year, the project attends its objectives.

Dageforde Residence

Darren Dageforde, P.E., director of utilities at the University of Nebraska Medical Center, Omaha, Neb., receives first place in the new residential category for the home he and his wife Karen designed and built in Blair, Neb.

The Dagefordes sought to create an extremely energy efficient home with minimal maintenance, low utility costs and at a reasonable budget. The resulting design was an air conditioner-less (no traditional air conditioner/furnace), walkout raised ranch home operating at an energy use density of a remarkable 5.24 kBtu/ft²-yr.

The house design is an adaptation of traditional high performance commercial and residential systems incorporating some state of the art technologies and original design concepts. The skeleton of the structure consists of insulated concrete form walls and concrete floors with a standard truss rafter system. A small solar array of 4.1KW of photovoltaic panels is installed on the roof. Environmental conditioning is provided by hydronic radiant heated and cooled floor slabs. The radiant system utilizes a large mass of the

insulated concrete flooring deck system as a thermal storage mass to evenly and continuously distribute thermal energy to the occupied environment. The radiant heating system is driven from water-to-water heat pump connected to five closed loop geothermal wells as the heat source.

An original application geothermal tempered fresh air supply system provides humidity and carbon dioxide control for the home. Domestic hot water is generated by a water-to-water heat pump also served from the geothermal well system. Through system integration “reject cooling” is recaptured from the domestic hot water heat pump for partially cooling the home in the summer time. Any required additional cooling is derived directly from the geothermal well system.

During the summer of 2012, the hottest summer on record in Nebraska, a total of 93 kWhrs was measured at an actual direct energy cost of \$3.70 to cool and air condition the house for the entire summer, a reduction of over 95 percent from an average regional house, not including the energy benefit of site generated energy. The slightly milder summer of 2013 required a mere 90 kWhrs for home cooling.

Though greatly more efficient than a typical house, this home was constructed at a cost significantly less than market price for a comparable custom home thus demonstrating the Dagefordes’ goal that incredible energy efficiency does not have to be expensive!

300 Davis Street Building

Stephen Hamstra, P.E., ASHRAE-Certified High-Performance Building Design Professional, chief technology officer, Greensleeves, Findlay, Ohio, receives first place in the new educational facilities category for the 300 Davis Street Building. The owner is The University of Findlay, Ohio.

The University of Findlay is the largest private college in Northwest Ohio and has a student population of approximately 3,600. The Davis Building was completed in 2012 and provides an approximately 42,000 square feet addition of science classrooms and related spaces. The overall building includes 26 lab/classroom spaces plus additional offices, conference rooms and support spaces.

Among the innovations incorporated in the building:

- A geothermal heat pump energy plant consisting of the magnetic-bearing chiller, pumps, variable speed drives and controls was factory-assembled at an ISO-9001 facility and shipped to the site in portions for site assembly. This significantly reduced construction and commissioning time as well as risk related to varying on-site conditions and quality control.
- A control system using anticipatory predictive algorithms for the geothermal heat exchanger (GHX) seasonal and daily pre-conditioning to minimize energy use in lieu traditional “real-time” control that triggers closed-circuit cooling tower (CCCT) operation when

the GHX temperature simply exceeds a setpoint. This means that the CCCT may operate during the night or during winter months to pre-condition the GHX for summer cooling and minimize summer daytime CCCT operation. Significant reductions in CCCT energy use and water use can be achieved by winter in lieu of summer operation due to lower ambient temperatures. The innovation is a control system that prevents excessive heat dumping in the winter.

- The control system measures and “learns” the actual building load imposed on the GHX and adjusts the pre-conditioning algorithms in relation to this intelligent model.
- Use of radiant cooling and active chilled beam sensible cooling via ground temperature water in lieu of chiller operation for much of the year.

If the cost premium for the installed system was assumed to be \$2.50 per square foot vs. a conventional HVAC system, the simple payback based on the above analysis is less than 1.5 years. (\$105,000 / \$82,925 estimated annual savings = 1.27 years). The reduced energy use as noted above provides estimated emission reductions as follows: carbon dioxide reduction of 800+ tons per year; sulfur dioxide reduction of 12,000+ grams per year; and mononitrogen oxide reduction of 3,000+ grams per year. In addition, the project saw a reduction in water use for heat rejection and reduced cooling tower water chemical treatment by automatic wet or dry operation of the closed circuit cooling tower.

Locust Trace AgriScience Farm

Stephanie Febles, mechanical engineer, CMTA Consulting Engineers, Lexington, Ky., receives first place in the new educational facilities category for Locust Trace AgriScience Farm. The owner is Fayette County Public Schools, Lexington, Ky.

Locust Trace AgriScience Farm in Lexington, Kentucky is an 82 acre, new vocational high school campus, consisting of a 43,000 square foot academic building, a 3,500 square foot greenhouse and a 21,500 square foot arena building. The school system decided to approach “net zero site consumed vs. site produced,” which means that the building will produce as much energy as it consumes at the building site.

The building also boasts a 168 panel evacuated tube solar thermal array that is utilized to offset the entire building heating load, that when designed, was the third largest system in North America. The solar thermal array is capable of one million BTUs of peak generation and generates hot water for duct-mounted hot water coils, fin tube radiant heaters, and the energy recovery wheel hot water coil. On a cool cloudy day, geothermal water to water heat pumps back up the solar thermal system.

There is a plug load controls system installed throughout the building. Almost every receptacle in the building is swept off at night. Specific receptacles remain on due to the fact that they are lighting for incubators or filters for aquariums. The teachers can override both the lighting

Another interesting innovation was inclusion of a web-based system with a touch screen system located in the front lobby. The occupants of Locust Trace believe that the best way to change the behavior of building occupants is to let them take ownership of how the building is being utilized. The energy usage and several other building vitals are displayed for the students, faculty and the district. Part of every elementary, middle and high school curriculum is an energy module. This information, being web based, allows teachers district wide to incorporate this information into their teaching lessons.

2014 Winter Conference

Importance of Building Performance Illustrated by ASHRAE Certification Program

ATLANTA – Starting out on the right step in the design, construction and operation of buildings to ensure optimum building performance is crucial. One way ASHRAE is working to improve performance, of both people and buildings, is through its certification program.

ASHRAE's certification programs recognize industry professionals who have mastered the knowledge and skills reflecting best practices in certain aspects of building design and operations. Earning this recognized, high-quality industry certification is a distinct honor that demonstrates value to the design process and serves as a springboard for continued professional development. ASHRAE has certified more than 1,600 HVAC&R professionals.

All six of ASHRAE's certification exams are being given as part of ASHRAE's 2014 Winter Conference, Jan. 18-22, at the New York Hilton, New York, N.Y., www.ashrae.org/newyork. The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, runs Jan. 21-23, www.ahrexpo.com. The Expo, held at the Javits Convention Center, takes place Tuesday, Wednesday and Thursday as opposed to the traditional Monday, Tuesday and Wednesday.

Take advantage of ASHRAE's special administration of the certification examinations on Jan. 23, 2014. The deadline to apply is Jan. 3, 2014. For complete information, visit www.ashrae.org/2014nycexams.

ASHRAE's six certifications are:

- Building Energy Assessment Professional (BEAP)
- Building Energy Modeling Professional (BEMP)
- Commissioning Process Management Professional (CPMP)
- High-Performance Building Design Professional (HBDP)
- Healthcare Facility Design Professional (HFDp)

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