THE HOT AIR DIFFUSER

Idaho ASHRAE Chapter Newsletter

NOVEMBER 2011 Volume 18 Issue 3

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NOVEMBER PROGRAM*

This month's chapter meeting will be a presentation of "Ice Thermal Storage Applications" by John Lau from Baltimore Air Coil.

John joined Baltimore Aircoil Company (BAC) in 1995. As Senior Technical Engineer, he assisted in the design of ice thermal storage systems throughout the world. In 1999, John was promoted to the position of International Market Manager responsible for directing and supporting BAC's international market activities. In June 2006, John was appointed General Manager, Sales and Marketing for Greater China. During his 4 year international assignment in China, John helped to establish BAC as the market leader in ice thermal storage in the Greater China region.

John and his family moved back to Baltimore in June 2010. As Manager of Thermal Storage for BAC, he is currently responsible for the Company's ice thermal storage market development and product applications.

John holds a Bachelor of Science degree in Electrical Engineering from the University of Tennessee and a MBA from the John Hopkins University. Prior to joining Baltimore Aircoil Company, John worked for Westinghouse Electric Corporation as an electrical engineer and later as a program manager with responsibility for design, development, and manufacturing of electronics equipment for the space and aviation industry.

When: **WEDNESDAY, Nov. 9 (11:45AM-1:00PM)**

Where: **Idaho Power Building 1221 W. Idaho Street Boise, Idaho**

***Please RSVP at www.idahoashrae.com**

INSIDE THIS ISSUE:

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.

IMPORTANT DATES

NOV. 9, 2011—ASHRAE MONTHLY MEETING

NOV. 24, 2011—THANKSGIVING DAY

DEC. 14, 2011—ASHRAE MONTHLY MEETING

JANUARY 11, 2012—ASHRAE MONTHLY MEETING

RESEARCH PROMOTION

Our list of donors for this year's campaign continues to expand. Norbryhn Equipment Company has shown their support of ASHRAE research this past month. They join Northwest Service Technologies and Cory Law who got their names on the list early this year. Please join me in giving them a hearty "Thank you very much!" for their generosity.

As in years past, certificates are being prepared for distribution at the November meeting to recognize our past donors. It is my privilege to present these items to you. If you have not received your coin from last year or your coin holder is full, please let me know and I will help you out.

Remember that you can make your donation 24 hours a day online at www.ashrae.org/contribute with your credit or debit card, or call me and I will do whatever I can to facilitate your donation. Thanks again to everyone who has given so generously to further the mission of ASHRAE! Your gift is very much appreciated. I look forward to seeing you all at the monthly meeting!

Scott Mackay, PE
Research Promotion Chair

HISTORY LESSON

Five Years Ago

The chapter president was Arden Davis. The meeting was held on Friday, November 10, 2006, at the Idaho Power Building. Bart Powelson, Copeland compressors, discussed current compressor trends in the HVAC industry including energy efficiency, capacity modulation, refrigeration transitions, and 13 SEER residential units.

Ten Years Ago

The chapter president was Greg Hobbs. The meeting was held on Friday, November 9, 2001, at the Doubletree Riverside. Leslie Goddard, Idaho Human Rights Commission, gave a presentation on Idaho's equal employment opportunity laws and how they relate to discrimination in employment.

Fifteen Years Ago

The chapter president was Chuck Keene. The meeting was held on Friday, November 8, 1996, at the Red Lion Riverside. Jan Packwood, Executive vice President, Idaho Power Company, gave a presentation on energy deregulation and how it will affect us all, both individually and commercially.

Twenty Years Ago

The chapter president was Ken Tewksbury. The meeting was held on Friday, November 8, 1991 at the King's Table Restaurant. The meeting was a panel discussion concerning the problems with the hydroelectric dams and the hindrance to fish migration. The panelists were Steve Herndon, Attorney, Idaho Power Company, representing the utilities; Ed Chaney, President, Chinook Northwest Inc., and Director of Northwest Resources Information Center Inc., representing fish and fishing interests; Andy Brunelle, Special Assistant in the Office of Governor Cecil Andrus, representing the governmental issues and concerns; and Tim Clemens, Idaho ASHRAE Program Committee Chairman, moderator.

Twenty Five Years Ago

The chapter president was Adrian Fannin. The meeting was held on Friday, November 14, 1986, at the Kings Table Restaurant. The meeting was a panel discussion of benefits and disadvantages of the "Design-Build" process compared to the conventional "Design-Specify-Bid-Build" process. The panelists were Dave Hamann, Mechanical Engineer, Engineering Consultants Inc.; Art Albanese, Architect, ZGA Architects; Tim Lamott, Mechanical contractor, TML Inc.; Lee Longson, Mechanical Supplier, Peterson Associates; and Dave Musgrove, Musgrove Engineering, moderator.

NEWS FROM THE HOME OFFICE

ASHRAE Names New Distinguished Lecturers

ATLANTA – ASHRAE has named 12 new Distinguished Lecturers who provide Society chapters with noted authorities and speak on relevant topics that impact the HVAC&R industry. This marks the 12th year of the Distinguished Lecturer Program, with over 1200 lectures given since the program began in 1999. The total 75 Lecturers for the 2011-12 Society year represent 13 countries, including Argentina, Malaysia, Colombia, Hong Kong, Egypt, India, Thailand, Canada, Singapore, Mexico, Taiwan, Sri Lanka and the United States. These lecturers are available to present on 324 topics and speak a combined nine languages.

The new lecturers and their presentation topics are:

•Qingyan (Yan) Chen, Ph.D., Purdue University, West Lafayette, Ind.—"Computational Fluid Dynamics for Indoor Environment Modeling: Past, Present, and Future;" "Designing Healthy, Safe, and Energy-Efficient Buildings;" and "Low Carbon and Energy Efficient Green Buildings."

•Arthur Hallstrom, P.E., ASHRAE Certified Building Energy Modeling Professional, AD Hall and Associates, Lexington, Ky.—"Where are we headed?"

•Sheila Hayter, P.E., National Renewable Energy Lab, Lakewood, Colo.—"Integrating Renewable Energy Systems into Buildings."

•Kishor Khankari, Ph.D., Syska Hennessy, Ann Arbor, Mich.—"Design and Analysis of Natural Ventilation Systems;" "Stratified Air Ventilation Systems;" "Application of Computational Fluid Dynamics (CFD) for Built Environment;" and "Airflow Management Best Practices for Data Centers."

•Peter Simmonds, Ph.D., IBE Consulting Engineers, Sherman Oaks, Calif.—"Designing Comfortable Buildings;" "Radiant Systems for Occupant Comfort;" "High Performance Buildings and Occupant Comfort."

•Kuan-Hsiung "Jerry" Yang, Ph.D., National Sun Yat-Sen University, Kaohsiung, Taiwan—"The Green HVAC Concept – HVAC System Renovation in Existing Buildings;" "Energy Auditing and Diagnostics in Existing Commercial Buildings using BEMS, and Residential Buildings using HEMS;" "Design Analysis of Smoke Management and Egress Systems in Malls, Atria, and Large Spaces;" "Design Analysis on Tunnel Ventilation under Emergency Operation Modes."

•Chandana Dalugoda, Chandana Dalugoda Consultants, Piliyandala, Sri Lanka—"Air Conditioning Systems for Tropical Humid Climates," "Applied Psychometrics for Air Conditioning Systems," "Cooling Load Calculations ASHRAE CLTC/SCL/CLF Method"

•Eckhard Groll, Ph.D., Purdue University, West Lafayette, Ind.—"Update on Refrigerants: Past, Present and Future," "Review of Compression Concepts for Heat Pumping, Air Conditioning and Refrigeration Applications"

•José Frias Lavalle, Dhimex Sa Cv, Mexico City, Mexico—"Expansion, Pressurization and Control of the Air in Hydronic Systems,""Hydraulic Principles," "Hydronic Systems,""Installation, Operation and Maintenance of Centrifugal Pumps,""Potable Hot Water Supply Systems," "Selection of Centrifugal Pumps,""Thermodynamic Principles of Heat Exchange" and "Variable Speed Pumping Systems"

•Kirk Mescher, P.E., CM Engineering, Columbia, Mo.—"Geo-Exchange 101—Owners, Architects & Engineers—What They Need to Know," "12 Steps to Improved Geo-Exchange System Design & Performance" and "Outside Air Systems for Geo-Exchange."

•Ross Montgomery, P.E., ASHRAE Certified Building Energy Assessment Professional, Building Energy Modeling Professional and Commissioning Process Management Professional, QST, Palmetto, Fla.—"ASHRAE 'BeQ' Energy Labeling Program—Overview."

•Raymond Patenaude, P.E. ASHRAE Certified Commissioning Process Management Professional, The Holmes Agency, Tierra Verde, Fla.—"Fundamentals of Building Envelopes in Hot and Humid Climates."

For a complete listing of Distinguished Lecturers and detailed procedures on how to arrange a lecturer presentation, visit www.ashrae.org/distinguishedlecturers.

For additional information, contact Rosy Douglas, manager of chapter programs, at rdouglas@ashrae.org or 678-539-1128.

ASHRAE Announces the Seventh International Conference on Cold Climate and Call for Papers

ATLANTA—ASHRAE, along with HVAC&R, architecture, interior design and building construction industry colleagues from around the world, will host the seventh International HVAC Cold Climate Conference, Nov. 12-14, 2012, in Calgary, Alberta, Canada.

Cold Climate HVAC 2012 will provide key elements of a strategy by which scientists, designers, engineers, manufacturers and other decision makers in cold climate regions can achieve good indoor environmental quality (IEQ), with a minimum use of resources and energy.

The range of topics includes energy and sustainability in arctic environments; building technology for people in the arctic; indoor environment and health; challenges for remote areas; cold climate building envelopes and moisture management; HVAC system operation and maintenance; and cold climate standards, codes, regulations and requirements.

The planning committee seeks papers featuring innovations in cold climate HVAC design. This includes new technologies and applications; improved methodologies, improvements to computational models or other design tools; novel methods of management, organization or quality assurance; and novel avenues of research or revised conceptual frameworks for designers.

Submit abstracts no longer than 350 words, which summarize the objectives, approach, results and conclusions of the proposed paper, and five to seven keywords by Dec. 1, 2011. Upon acceptance, papers will be due April 1, 2012. For specific topics, to submit a conference paper abstract or for more information go to www.ashrae.org/ColdClimate. For additional information, contact meetings@ashrae.org.

The Scandinavian Federation of Heating, Ventilation and Sanitary Engineering Associations (SCANVAC) initiated

the series of Cold Climate HVAC Conferences. The six previous conferences have been successfully organized in Rovaniemi, Finland in 1994; Reykjavik, Iceland in 1997; Sapporo, Japan in 2000; Trondheim, Norway in 2003; Moscow, Russia in 2006; and Sisimiut, Greenland in 2009.

The series of congresses have earlier been supported by national HVAC societies, the Federation of European Heating, Ventilation and Air Condition Associations (RHEVA) and ASHRAE.

ASHRAE Assists Students with Tuition through Scholarships

ATLANTA—To help support future generations of engineers, ASHRAE is awarding over $74,000 in scholarship money for the 2011-2012 school year.

"ASHRAE's scholarship program has a strong history of supporting students," William Murphy, Ph.D., P.E., chair of the Scholarship Trustees, said. "Many students who are seeking outside help to attend college are already working in the industry part time and are planning their careers around an area of HVAC&R. We hope that this early exposure to the industry will lead to employment opportunities in the field during and after college. These are future ASHRAE members and industry leaders, and ASHRAE is pleased to help them along their way."

The 17 recipients of ASHRAE's scholarship assistance are as follows:

• Reuben Trane Scholarship: $10,000 to be awarded over two years, Andrew James, California State Polytechnic University, mechanical engineering. The scholarship was established by the Trane Co. in memory of its founder, an innovative engineer, inventor and business executive.

• Willis H. Carrier Scholarships: $10,000 for one year, Kimberly Luebcke, Southern Illinois University-Edwardsville, mechanical engineering; and Daniel Nish, University of Akron, mechanical engineering. The scholarship was established by the Carrier Corp. in memory of its founder, who installed the world's first scientifically designed air-conditioning system.

• Frank M. Coda: $5,000 for one year, Sze Wong, City University of Hong Kong, mechanical engineering. The scholarship was created in memory of ASHRAE's former executive vice president, who served from 1981-2004.

The following awards include one-year $3,000 scholarships:

• Duane Hanson Scholarship: Zachary Koehnke, California State Polytechnic University, mechanical engineering. The scholarship was established by Gayner Engineers and is named for the company's former president.

• Alwin B. Newton Scholarship: Isaac Lima, University of Central Florida, mechanical engineering. The scholarship is named for an industry pioneer and ASHRAE Fellow who was granted 219 patents.

• Henry Adams Scholarship: Matthew Reeves, University of South Florida, pre-engineering. The scholarship was established by Henry Adams Inc. in memory of its founder, a Charter Member and sixth president of ASHRAE'S predecessor society, ASHVE, in 1899.

• ASHRAE Region IV/Benny Bootle Scholarship: Steven Wrightenberry, North Carolina State University, aerospace engineering. The scholarship was established collaboratively by Region IV and Benny Bootle, a former Region IV director and regional chair on the ASHRAE Board of Directors.

• ASHRAE Region VIII Scholarship: Ashley Neese, University of Oklahoma, aerospace engineering. This scholarship was established by Region VIII, which includes Arkansas, Oklahoma and Mexico and parts of Louisiana and Texas.

• ASHRAE Memorial Scholarship: Valerie Smith, Kettering University, mechanical engineering.

• ASHRAE General Scholarships: Tao Yu, University of Cincinnati, mechanical engineering; and Hannah Jones, Cedarville University, mechanical engineering.

• High School Senior Scholarships: Boyd King, Arkansas Technical University, engineering; and Justin Altemus, University of Delaware, engineering. The scholarships were established in 2010 for high school seniors entering their freshman year of college in engineering or engineering technology program.

- Engineering Technology Scholarships: Addie Farr, Dunwoody College of Technology, heating, air-conditioning systems design; Anthony Stamm, John A. Logan College, HVAC&R and green technology; and Rhone Jadis, DeVry University, electronics engineering technology.

ASHRAE has created two new undergraduate scholarships to begin awarding for the 2012-13 Society year. They are the:

• Boggarm S. Setty Scholarship, which will award a one-year $3,000 scholarship to an undergraduate engineering student attending an institution within ASHRAE Region III, which covers Delaware, Maryland, southern New Jersey, Pennsylvania, Virginia and Washington, D.C.

An ASHRAE Fellow and a member of the Society since 1972, Setty has served on more than 50 technical committees for the society.

• David C.J. Peters Scholarship, which will award a one-year $5,0000 scholarship to a third-year student in a four-year undergraduate mechanical engineering program or a fourth-year student in a five-year undergraduate mechanical engineering program at Pennsylvania State University, Virginia Polytechnic Institute and State University or California State University at San Louis Obispo. The scholarship was created by Southland Industries to honor Peters, a tireless advocate of recruiting quality.

Over the course of 20 years ASHRAE has awarded a combined $1 million to over 200 deserving undergraduate and graduate students. It is ASHRAE's belief that aiding these future leaders of the heating, ventilation, air-conditioning and refrigeration industry will in turn benefit society as they lead the way in sustainable HVAC&R technology.

For more information on ASHRAE scholarships, visit www.ashrae.org/scholarships. Applications are now being accepted for the 2012-13 undergraduate, regional and university-specific scholarships. The deadline is Dec. 1, 2011.

Standard 90.1-2007 Established as National Reference Standard for Federal, Commercial Buildings by DOE

ATLANTA – Commercial and high-rise residential buildings, including federal buildings, must now meet requirements in ASHRAE/IESNA's 2007 energy efficiency standard, under recent rulings issued by the United States Department of Energy (DOE) that finds the standard saves more energy than the 2004 version.

ANSI/ASHRAE/IESNA Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings, has been established by the DOE as the commercial building reference standard for state building energy codes under the federal Energy Conservation and Production Act. As a result, states are required to certify by July 20, 2013, that they have reviewed and updated the provisions of their commercial building code regarding energy efficiency, including a demonstration that the provisions of their commercial building codes regarding energy efficiency meet or exceed 90.1-2007.

The DOE also has issued a rule that requires new federal buildings, for which the design for construction begins on or after Oct. 11, 2012, to meet the requirements of 90.1-2007.

Prior to the new rules, federal and commercial buildings had to meet requirements in the 2004 standard.

"We are pleased with this recognition that the 2007 standard saves more energy than the 2004 standard, thereby pushing the marketplace toward more energy-efficient buildings," ASHRAE President Ron Jarnagin said. "ASHRAE continues to build on the foundation of efficiency contained in Standard 90.1. We recently published the 2010 version of the standard, which results in more than 30 percent energy savings over the 2004 version. We currently are working on the 2013 standard, with a renewed focus on increasing the stringency to achieve a significant reduction in energy consumption."

The Illuminating Engineering Society (IES), cosponsor of the 90.1 standard, is also pleased with the DOE's favorable determination on the energy savings achieved in 90.1-2007, according to Rita Harrold, IES director of technology.

"As ASHRAE President Ron Jarnagin indicates, the work is ongoing through the dedication and expertise of voluntary consensus committee members from both organizations who continue to meet the challenge of developing additional requirements for energy efficient buildings," Harrold said.

"The DOE has determined that the quantitative analysis of the energy consumption of buildings built to Standard 90.1-2007, as compared to buildings built to Standard 90.1-2004, indicates national source energy savings of approximately 3.9 percent of commercial building consumption," according to the DOE. "Additionally, DOE has determined site energy savings are estimated to be approximately 4.6 percent."

The DOE noted that the newer version of the standard contained 11 positive impacts on energy efficiency. These impacts included changes made through the public review process in which users of the standard comment and offer guidance on proposed requirements. The positive impacts include:

- Increased requirements for building vestibules;
- removal of data processing centers and hotel rooms from exceptions to HVAC
- Modification of requirements regarding demand controlled ventilation, fan power limitations, retail display lighting requirements, cooling tower testing requirements, commercial boiler requirements, part load fan requirements, opaque envelope requirements and fenestration envelope requirements.

ASHRAE and IES currently are working on the 2013 standard, having published the 2010 last year. Some 30 percent energy savings can be achieved using the 2010 version of Standard 90.1 vs. the 2004 standard. Without plug loads, site energy savings are 32.6 percent and energy cost savings 30.1 percent. Including plug loads, the site energy savings are estimated at 25.5 percent and energy cost savings 24 percent.

Since being developed in response to the energy crisis in the 1970s, Standard 90.1 now influences building designs worldwide. It has become the basis for building codes, and the standard for building design and construction throughout the United States. ASHRAE and IES publish a revised version of the standard every three years.

Students Dig Deep in Practical Design Knowledge to Win ASHRAE Design Competition

ATLANTA—ASHRAE's 2011 Student Design Competition drilled students on their knowledge of HVAC&R system selection and design as well as integrated building design to encourage practical design.

This year's Competition featured a mock design of the Drake Well Museum located in Titusville, Pa., the site where Edwin L. Drake drilled the world's first oil well in 1859 and launched the modern petroleum industry. Among the 20-plus entries from around the world, three were awarded first place in the three categories that the Competition offers.

First place in HVAC System Design is awarded to Holly Brink, Michael Crabb, James Dougherty Jr., Andrew Gilliam and Gina Halbom of the University of Nebraska. Their faculty advisor is Grenville Yuil, Ph.D.

After analyzing three system designs, the team chose a variable air volume system with heat and ground cooled geothermal heat recovery chiller/heater. The higher initial cost of the system is countered by its overall efficiency, low maintenance and federal tax incentives. The final system design outperformed baseline case energy by 33 percent.

The team noted that, "sustainability is a difficult achievement when considering the design for museum buildings. For HVAC design, the strict temperature and humidity requirements increase the amount of energy needed for tempering outdoor air. Also, the additional MERV filters that protect air quality increase the ductwork's static pressure and thus increase the amount of fan energy needed for maintaining airflow. It is the team's opinion that the positive aspects of the design outweigh the higher cost. These positive aspects help preserve the history of the nation's oil industry while reducing the museum's impact on the environment."

First place in HVAC System Selection is awarded to Lynn Gualtieri, Evan Oda, Kristin Porter, Navid Saiidnia, Jeffrey Wong and Cameron Young of California Polytechnic State University, San Luis Obispo, Calif. Their faculty advisor is Jesse Maddren.

The team chose a water-source variable refrigerant volume (VRV) system, which includes a ground-source water loop, a dedicated outdoor air (DOA) unit and humidifiers, as well as addition of a solar array. The VRV is split into two systems: a constant environmental control system for the collections areas and galleries, and a standard environmental control system for the offices, education center, auditorium and lobby. In each separate system the latent and sensible load were decoupled – the VRV fan coils handle the sensible load while a DOA unit with humidifiers handles the latent load.

This setup allows the entire VRV system to control the indoor environment to specified conditions. The advantage of having two systems is the standard environmental control system can be completely shut off during non-occupied hours, which saves energy when compared to running a single large DOA at very low part load.

First place in Integrated Sustainable Building Design is awarded to Te Qi, Zhang Qiqi and Chen Yuanyi of Tianjin University, China. Their advisors are Liu Junjie and Long Zhengwei.

The students integrated a ground-source heat pump for space conditioning and domestic hot water; optimized the fenestration (quantity, location and type of windows); added a solar heat storage system with thermal solar collector; changed the building orientation to 5 degrees south to the east for more efficient orientation; and used thermal mass in walls to reduce heating and cooling loads.

The team had to build detailed energy simulation models, and they demonstrated they understood synergy and compromise when they noted "as for modeling and simulation research, it is essential to integrate different modeling strategy to evaluate a building performance. Through this process, we find sometimes they contradict each other. However, they sometimes support each other. "

The competition recognizes outstanding student design projects, encourages undergraduate students to become involved in the profession, promotes teamwork and allows students to apply their knowledge of practical design.

The first place teams are given 10-15 minutes to present their projects at the 2012 Winter Conference in Chicago, Jan. 21 -25.

New Cool Tool from ASHRAE – Helps Predict Consistent Thermal Comfort

ATLANTA – An updated tool from ASHRAE provides a user-friendly interface to predict thermal comfort, based on the Society's standard for thermal environmental conditions.

ASHRAE Thermal Comfort Tool, Version 2, maintains consistency with ANSI/ASHRAE Standard 55-2010, Thermal Environmental Conditions for Human Occupancy. The standard specifies the combinations of indoor thermal environmental factors and personal factors that will produce thermal environmental conditions acceptable to a majority of the occupants within the space.

The tool makes thermal comfort predictions using several existing thermal comfort models, including the Adaptive and Predicted Mean Vote (PMV) models. Inclusion of these models can potentially improve occupant comfort by allowing engineers to more easily fine tune their comfort analysis to the particular needs of the occupants in the building.

"The software allows you to calculate the predicted thermal comfort for a human at a point in space," Bill Fleming, volunteer chair of ASHRAE's Publications Committee, said. "All you need to do a comfort analysis is some basic information about the thermal environment you want to model and a few things about the person you want to put in that environment."

The cost of the ASHRAE Thermal Comfort Tool is $117 ($99, ASHRAE members). To order, contact ASHRAE Customer Contact Center at 1-800-527-4723 (United States and Canada) or 404-636-8400 (worldwide), fax 404-321-5478, or visit www.ashrae.org/bookstore.

ASHRAE, AHR Expo Return to Chicago for 2012 Winter Conference

ATLANTA—Registration is open for ASHRAE's 2012 Winter Conference in Chicago where attendees have the chance to discuss and examine the latest topics in the building industry, such as high performing buildings and integrated design, as well as participate in technical tours; attend ASHRAE Learning Institute courses; earn professional credits; and obtain ASHRAE certifications.

The 2012 Winter Conference takes place Jan. 21-25 at the Palmer House Hilton. The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, will run Jan. 23-25. The Expo, www.ahrexpo.com, is held at the McCormick Place.

In keeping with ASHRAE's goal of continuing education the Conference offers over 200 Professional Development Hours, as well as Continuing Education Units, which can be applied toward a Professional Engineering license.

The technical program features more than 90 programs and 300 speakers addressing energy modeling applications; integrated design; healthcare, laboratories and data center applications, among others; operations and maintenance; high performance buildings; as well as refrigeration and systems and equipment sessions. Additionally, there is a new "mini-conference" on Installation, Operation & Maintenance of HVAC Systems built within the Technical Program. The O&M mini-conference is scheduled on Jan. 22-23. The full Technical Program, which will be announced later this month, offers the opportunity to earn a year's worth of PDHs, NY PDHs, AIA LUs and LEED AP credits.

The Chicago Virtual Conference is included with a paid Conference registration—comp and single day registration excluded—and includes on-demand access to all speakers' audio presentations synced to their presentations. Attendees and speakers can post comments on the presentations for a two-week period. Those not attending the Chicago Winter Conference in person may register for the Virtual Conference only. Register at www.ashrae.org/chicagovirtual.

Five Professional Development Seminars and 15 Short Courses are offered to help industry professionals stay current on HVAC technology, including how to apply the newest ASHRAE standards. The ASHRAE Learning Institute (ALI) is

offering a new half-day short course on the basics of combined heating and power systems, as well as updates to the full-day professional development seminars focusing on Standards 62.1, Ventilation for Acceptable Indoor Air Quality, and 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings. ALI courses are approved for renewal of professional engineer and professional architect licenses, as well as for industry certification programs.

Additionally, ASHRAE offers a special administration of all six certification examinations on Jan. 25: 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) and Operations & Performance Management Professional (OPMP). ASHRAE's certification program recognizes industry professionals who have mastered knowledge and skills
reflecting best practices in certain aspects of building design and operations. More information on each certification can be found at www.ashrae.org/chicagoexams.

ASHRAE Conference technical tours give you a first-hand look at technology developed by members to further the industry. Tours include the North Central College Residential and Recreation Center, Loyola University Information Commons, the University of Chicago Mansueto Library and Rush University Medical Center Central Energy Plant.
The Winter Conference also includes a program designed for students of the Society. Highlights of the program, held on Sunday, Jan. 22, include speakers, a professional development session and presentations by the recipients of the Student Design Competition and a technical tour of the University of Chicago library.

To register and for complete Conference information, visit www.ashrae.org/chicago.

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