

THE HOT AIR DIFFUSER

Chapter Newsletter

NOVEMBER 2014 Volume 20 Issue 9



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NOVEMBER CHAPTER MEETING



Topic: Liens & Other Payment Remedies

This month's speaker will be Geoff McConnell from McConnell Wagner Sykes + Stacey PLLC. Geoff is an attorney specializing in construction litigation and will be speaking about the legal view of the construction process. Who is responsible for what, and your lien rights when working on private projects, publicly funded projects, and even tribal projects.

McCONNELL WAGNER SYKES + STACEY^{PLLC}
ATTORNEYS AT LAW

When:

Wednesday, November 12th, 2014
11:45am to 1:00pm MST

Where:

Idaho Power Building
1221 West Idaho Street
Boise, ID 83702

Please Register online at:

www.idahoashrae.com

OCTOBER:

Topic: Modern Hydronic System Designs for Condensing Boilers

The presentation discussed the principals behind primary only variable flow hydronic designs, the shortfalls of primary/secondary arrangements, proper control strategies for modular plants, and an example system applying this knowledge.



Last month's speaker was Kyle Bottorff from Fulton Boiler. Kyle is responsible for engineering application and sales support for the hot water commercial heating product lines, including proposal development, technical and professional development presentations, heating and process systems design, education of proper product application to maximize both boiler and overall system efficiency, and project management through collaboration with an array of internal departments and external vendors.

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 Spencer Shepard. The meeting was held on November 13, 2009, at the Idaho Power Building. Tom Zabala and Steve Turney, ZGA Architects, joined for a round table discussion on project interaction between architects and the HVAC design team.

Ten Years Ago

The chapter president was Tony Sutton. The meeting was held on November 12, 2004, at the Bank of America Centre. The program was a tour of the Bank of America Centre ice hockey arena.

Fifteen Years Ago

The chapter president was Ben Strawn. The meeting was held on November 12, 1999, at the Double Tree Riverside. Dan Taylor and Jack Hughs, Norco, gave a presentation on cryogenics and its application to our industry, including a demonstration using liquid nitrogen.

Twenty Five Years Ago

The chapter president was Dave Musgrove. The meeting was held on November 10, 1989, at the Kings Table Restaurant. The program was a panel discussion on system commissioning. The panel consisted of Don Wisdom, Engineering Inc., representing mechanical engineers; Bob “Stub” Clarkson, Ro-Bar Technology, representing the balancing engineers; Ray Hoobing, CM Corporation, representing general contractors; Lynn Jones, Idaho Department of Public Works Idaho Falls, representing owners; and Roger Albers, Engineering Inc., moderator.



PRESIDENT'S WELCOME MESSAGE

Hell All!

Can you believe fall is here, and winter seems to be not too far behind! If you have been like me, you are very busy at work and at home. I'm feeling a bit like a squirrel stocking up for winter. Your board along with all the committee chairs have also been very busy with ASHRAE business. We are still collecting information on the type of topics you are interested in and if you have interest in adding some evening sessions to our schedule, technical conference topic, or if you would like to get more involved, please fill out the questionnaire which can be found on the home page of our webpage.

Looking for CEUs or have an event you would like to promote? As a new service to the membership, we will be adding a section on the web page which lists HVAC related events in the community and national ASHRAE educational offerings. It will be coming soon, so check the webpage.

BRING A MEMBER! Yes we would like to increase the number of our members, but we also want to see more current members at our lunch meetings. So you, as an active member, please ask your fellow member who may be co-workers or friends, to come on down to the meeting! And by all means, encourage folks who are not ASHRAE members to join up. The RSVP system has been working well, so make sure to sign up on the webpage (www.idahoashrae.com) and let us know if you have any problems doing so. This month we will be talking about some of the legal aspects of our profession. Geoff McConnell will be presenting with his talk on liens, construction litigation and the legal aspect of the construction process. Geoff contributes articles to many publications with construction related topics and was named Lawyer of the Year in 2013 in the Litigation and Construction category. Geoff is currently a partner at McConnell Wagner Sykes and Stacey PLLC and has been practicing law since 1987. It sounds like it will be another educational meeting.

Hope to see you all next week,

Brad Acker

President, Idaho ASHRAE

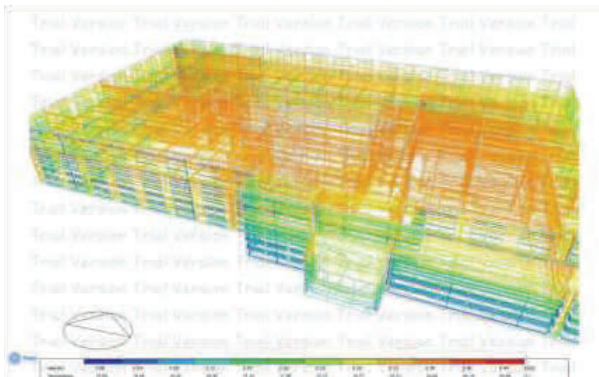


NEWS FROM THE HOME OFFICE

ASHRAE Announces Recipients of Student Design Competition: Applied Engineering Challenge

ATLANTA— Students who took part in ASHRAE's 2014 Student Design Competition were challenged to do research and design for a research and design development facility.

The 2014 student competition focuses on a two story office building in New York City with a research and development facility. ASHRAE student teams outside the United States were allowed to locate the building in the capital of their state, province or country.



ASHRAE also announces the recipients of the Applied Engineering Challenge, which focused on the need to improve indoor air quality (IAQ), particularly in residential applications in developing countries.

Among the 39 entries from 13 countries, four were awarded first place in the categories that the competition and challenge offer.

First place in HVAC Design Calculations is awarded to a team from the University of Central Florida, Orlando: Christopher Erickson, associate engineer, Universal Creative, Orlando; Ian Faulkner, mechanical designer, exp U.S. Services, Orlando, Fla.; DJ Marshall, mechanical engineer, TLC Engineering for Architecture, Orlando, Fla.; Richard Suarez, quality engineer, Rockwell Collins, San Diego, Calif.; Kristian Jack Szymanski, Coral Springs, Fla.; and Ju Young Yu, Winter Park, Fla. Their faculty advisor is Gabriel Vazquez, Ph.D.

The team's objective was to design a high efficiency HVAC system with long life cycle, and excellent indoor air quality while maintaining cost effectiveness. They selected variable refrigerant flow (VRF) systems with simultaneous heating and cooling and dedicated outdoor air systems (DOAS) with energy recovery. Other equipment included air valves for lab areas and high efficiency particulate absorption (HEPA) filters and exhaust fans to eliminate contamination.

A 20 ton DOAS unit, three condensing units and several heat recovery units were used to supply required air to all types of VRF units contained within the building. A separate 50 ton DOAS unit was used for lab areas due to the high air change requirement of the clean room and high exhaust rate in the four research and development areas. For each DOAS unit, an exhaust fan was used, and one additional exhaust fan was selected for emergencies only, such as in the case of a refrigeration leak.

The total cost associated with the selected systems was \$570,203. The design encompasses efficiency, health and safety, comfort, functionality, longevity, flexibility and maintainability with a low life cycle cost.

First place in HVAC System Selection is awarded to a team from Kansas State University, Manhattan, Kans.: John Gaito, Kathryn Helmer, Lexie Oliver, Alex Pint, Megan C. Walkowiak and Gordon Zimmerman, all of whom are senior level students in architectural engineering. Faculty advisors are Julia Keen, Ph.D., P.E., HPBD, and Fred Hasler, P.E.

The students selected a ground source heat pump (GSHP) system where water is pumped through vertical piping in the ground, providing a heat source and heat sink for the heat pumps. The main water loop serves the heat pumps and DOAS allowing heat transfer between spaces to maximize energy efficiency.

The GSHP system met all the owner's requirements in using the ground as a heat sink and heat source to serve the building. As a result, the energy savings are immense. This creates a low-cost, reliable, flexible, maintainable, sustainable system.

An unusual addition to the system was incorporation of a wall of vegetation created by attaching plants that do not require soil to a mesh grid. Given that the building is used for research and design, the exhaust and ventilation rates are significant and consume large amounts of energy. Ten small bio-walls are used to decrease energy consumption for the entire building by decreasing the required ventilation in the office spaces.



NEWS FROM THE HOME OFFICE CONTINUED...

First place in Integrated Sustainable Building Design is awarded to a team from Montana State University, Bozeman: Elyse Casper; Theresa R. Lindenau, Bozeman, Mont.; Terra Moran, materials engineer, Imperial Oil, Calgary, Alberta; Mary Peterson, project engineer in the commercial solutions division, 3M, Saint Paul, Minn.; and Martin Reaves, founder, Monolithic, Bozeman, Mont. Their faculty advisor is Kevin Amende, P.E.

For the HVAC systems, students implemented multiple systems with high efficiencies, using the nearby river as a heat exchanger. The main system -- a VRF system -- is more expensive upfront, but more cost-effective and energy saving throughout the life of the building. It was implemented to condition the open office, library, meeting rooms, mailroom and HR office spaces. It has the additional benefit of requiring no duct work; only the routing of small refrigerant lines.

Fresh air is pre-conditioned by a heat recovery ventilation unit that exchanges energy with exhaust air leaving the building. This recovers energy while improving air quality. Fresh air is vented directly into the fan coil units in the VRF spaces, first mixing and then distributing throughout the rooms. Fresh air for the computer server and research and design spaces is ducted into the heat pumps and blown into the rooms directly. Acoustic and filtration specifications were addressed through appropriate noise dampening and filtration products.

Review of data showed energy consumption was reduced by almost 70 percent; cooling load was reduced by over 60 tons; and carbon and greenhouse gas emissions were more than halved. The new design pays back after year twelve, and saves the owner almost \$1 million by the end of 40 years. Although the design did not reach net-zero, the improvements were exponential. With a larger budget or new construction, the net zero goal could be realized.

ASHRAE also announces the recipients of the 2014 Applied Engineering Challenge, in which students were required to design and specify a small, portable air conditioner that must be affordable, maintainable and effective in the local cultural environment.

The first place Applied Engineering Challenge recipients are a team from California Polytechnic State University, San Luis Obispo: Juan Silva, sales operation, SYSERCO, Fremont, Calif.; and Nelson E. Echeverry, design engineer, Donald F. Dickerson Associates, Tarzana, Calif. Their faculty advisors are Steffen Peuker, Ph.D., and Jesse Maddren, Ph.D., P.E.

The system involves a series of measures that a family living in Mexico City can take to improve the IAQ in their house. Starting in the kitchen, a wood stove with a chimney attached was used to vent out the smoke caused from burning biomass. The stove provides heat-

ing during cold days, reduces pollution caused by inefficient cooking stoves and provides reliable operation.

Next, in the living room, a window fan was modified with an external air filter at the inlet of the fan, capturing most of the harmful contaminants and allowing fresh air to enter the house. With forced airflow, pollutants are dispersed, thus avoiding high concentrations. A window fan providing a capacity of 1400 CFM is sufficient to supply the entire house. For cooling, students chose a window unit, which helps in reducing humidity.

One major benefit is that units are portable and can easily be installed in a new or different home. Two financial tiers were created: one targets low to middle class families, providing equipment and devices to satisfy comfort needs and to improve healthy living, but with less expensive materials. The second tier for high to mid class families contains a power generator and window unit.

The projects will be shared at the 2015 ASHRAE Winter Conference, Jan. 24-28, Palmer House Hilton, Chicago, Ill. Also taking place at that time is the ASHRAE co-sponsored AHR Expo, Jan. 26-28, McCormick Place, Chicago.

Smart Inspection Drones Monitor Construction Sites for Violations

DUBAI—The Ministry of Labour has begun using drone technology to support its inspectors in recording violations at construction sites.

Saqr Ghobash, the Minister of Labour, has launched a specialised drone to look for companies violating the midday break law that bans labourers from working under direct sunlight during the hot summer months.

Mr Gobash said the drone technology improved the efficiency of the Ministry's field operations by providing an additional tool for its inspectors.

"It is very accurate and definitely saves the inspectors' time and efforts, as it allows the team to monitor every movement from the screen attached on the remote control then note any violations by taking close pictures," the minister said.



NEWS FROM THE HOME OFFICE CONTINUED...

The idea of the drone was introduced by the Information Technology Department at the Ministry of Labour then was developed in partnership with students from the higher colleges of technology in Dubai.

The drone used by the ministry covers around two square kilometres over a 15 to 20 minute period and can reach altitudes up to one kilometre.

The remote-controlled “smart inspections drone” is equipped with a high definition camera, providing live footage to the operator, and a built-in navigation system capable of sending the drone to the exact coordinates of a preferred location.

Ministry officials said the drone has proven invaluable in monitoring construction sights for violations of the mid-day break law that was enforced from June 15 until September 15 and flouted by fifty-six companies this year.

The Ministry of Labour is seeking to further develop the project by developing a direct link between the drone and the Ministry’s labour monitoring systems so video evidence can be used to issue fines on spot.

The UAE government has encouraged the practical use of drone technology to aid government departments in the country with Shiekh Mohammed bin Rashid, Vice President and Ruler of Dubai, launching a Dh1 million “UAE Drones for Good” competition last February.

Students from Ajman University of Science and Technology (AUST) have already contributed to the government’s practical use of drone technology by designing and building a firefighting drone for Ajman Civil Defence that can provide support in rescue missions.

Two drones have been patrolling Abu Dhabi’s ports since June while ‘Eye in the Sky’ technology is also being utilised to monitor the flamingo population at the Al Wathba Wetland Reserve.

More recently, drone technology is being sought to replace satellites with the first test flight of a high-altitude aerial drone carried out successfully in September by the Emirates Institute for Advanced Science and Technology (EIAST).

A federal law, expected this year, is being drafted by the General Civil Aviation Authority to license the use of drones in UAE airspace.

Massachusetts Tops California as Most Energy-Efficient State, while Arkansas, D.C., Kentucky, and Wisconsin are Most Improved

Washington, D.C.—Governors and lawmakers in state capitals across the nation continue to take major steps to lower energy costs, reduce pollution, and save consumers money by increasing their states’ energy efficiency, according to the findings of the 8th edition of the *State Energy Efficiency Scorecard* released today by the American Council for an Energy-Efficient Economy (ACEEE).

Available online at <http://aceee.org/state-policy/scorecard>, the report found that in 2014 Massachusetts (#1) continues to edge out California (#2) as the most energy-efficient state in the nation for the fourth year in a row. Following these states in the top 10 are: Rhode Island (marking the state’s first time in top five), Oregon, and Vermont (all tied for #3); Connecticut (#6); New York (#7); Washington (#8); Maryland (#9); and Minnesota (#10).

Other key *State Energy Efficiency Scorecard* findings include the following:

- Arkansas, the District of Columbia, Kentucky, and Wisconsin are the four most improved energy-efficiency states for 2014. Arkansas pushed forward with strong utility programs. The state’s budgets for electric efficiency programs increased 30% between 2012 and 2013, while electricity savings more than tripled. The District of Columbia and Wisconsin also saw upticks in energy savings. Kentucky took notable steps to adopt a more efficient commercial building energy code.
- From dead last and up, the five states most in need of improvement on energy efficiency in 2014 are North Dakota, Wyoming, South Dakota, Mississippi, and Alaska.
- Overall, states are ramping up their commitments to energy efficiency. Savings from electricity efficiency programs in 2013 totaled approximately 24.4 million megawatt-hours (MWh), a 7 percent increase over 2011 savings reported last year by ACEEE. Gas savings for 2013 were reported at 276 million therms (MMTherms), a 19 percent increase over the 2011 savings reported in the previous ACEEE *State Scorecard*.

NEWS FROM THE HOME OFFICE CONTINUED...

- A total of 23 states fell in the energy efficiency rankings in 2014. Indiana dropped the furthest, by 13 spots, due in part to state legislators' decision to eliminate the state's long-term energy savings goals. Legislators in Ohio made a similar decision to freeze and substantially weaken the state's energy efficiency resource standard (EERS), contributing to the state's fall of 7 spots down the rankings. Despite these policy setbacks, utilities in both states have indicated they will continue running efficiency programs, albeit at levels below what would have been required by the standards.
- ACEEE found that states that enforce and adequately fund an EERS drive investments in utility-sector energy efficiency programs. The states with the most aggressive savings targets include Arizona, Massachusetts, and Rhode Island.

Maggie Molina, Director of ACEEE's Utilities, State, and Local Policy program, said: "More and more governors and state lawmakers understand that they have a choice: Do nothing as costly energy is wasted or take action by creating incentives to waste less energy. Smart energy efficiency choices maintain the same comfort, convenience, and quality of life that consumers want and expect. Energy efficiency is also good for business. State action on energy efficiency improves bottom lines, drives investment across all sectors of the economy, creates jobs, and offsets the environmental harms created by the energy production system."

Massachusetts Governor Deval Patrick said: "We have treated efficiency as our first fuel because saving energy, managing costs, and reducing environmental impacts while building a stronger cleantech economy helps fulfill our responsibility to future generations to leave a stronger Commonwealth than we found."

JD Lowery, Director of the Arkansas Energy Office, a division of the Arkansas Economic Development Commission, said: "Much of Arkansas' improvement must be attributed to the ongoing leadership of our Arkansas Public Service Commissioners, our utility partners, and our citizens. Through innovative programs, both businesses and households in Arkansas have discovered the economic benefits of investing in energy efficiency. Energy efficiency is no longer this unknown thing. We're creating jobs while saving Arkansans money. Everybody wins."

CHILLVENTA: A Chiller launched using water as refrigerant

RAC—A German energy specialist has launched what it claims is the world's first production-scale chiller using water as refrigerant at the Chillventa exhibition in Germany.

The launch has provided the major talking point from the show's first day.

Efficient Energy said its eChiller, available initially as a 45 kW unit features bespoke components to provide a highly efficient package - which the firm appears to claim could save up to 50 per cent over conventional chillers in its class.

While technical details in English are currently in short supply, the firm says that the key to using water as refrigerant is a patent micro-turbined centrifugal compressor which rotate at up to 90,000 rpm to increase pressure and therefore temperature in the fraction of water leaving the evaporator.

The resulting steam is condensed directly into the remaining cool water flow

Use of infinitely variable oil-free turbo compressors enables the eChiller's cooling capacity to be adjusted continuously from 10 per cent to 100 per cent, while an intelligently controlled refrigerant circuit enables efficient modulation in response to changes in the ambient temperature.

Among other benefits are a free-cooling function that doesn't require an additional free-cooling circuit and the fact that using water makes it immediately F-gas compliant, the firm says.

Products offering 20 kW and 90 kW capacity are set to follow shortly.

The firm said that the temperature difference between evaporation and the cold water temperature and between condensing and the heat exchange temperature are minimal, making heat transfer losses negligible.

The firm also claims very low pressure drop from the refrigerant to the compressor.

NEWS FROM THE HOME OFFICE CONTINUED...

DOE Updates National Reference Standard for Commercial Buildings To 90.1-2013

ATLANTA—Following preliminary analysis that ASHRAE/IES's 2013 energy efficiency standard contains energy savings over the 2010 standard - 8.5 percent source energy savings and 7.6 site energy savings - the U.S. Department of Energy (DOE) has issued a ruling that establishes the 2013 standard as the commercial building reference standard for state building energy codes.

In an announcement in the Sept. 26, 2014 edition of "The Federal Register," DOE attributes the greater energy savings to improvements in ANSI/ASHRAE/IES Standard 90.1-2013, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, related to several areas, including better lighting, fans, commercial refrigeration, boilers and controls.

The determination means that states are required to update their codes to meet or exceed the 2013 standard within two years. Currently, states must meet or exceed the 2010 standard, which serves as the commercial building reference standard for state building energy codes under the federal Energy Conservation and Production Act.

"ASHRAE is pleased with this ruling from the DOE, recognizing the energy savings measures in the standard," ASHRAE President Tom Phoenix said. "Standard 90.1 was an original cornerstone in our efforts to improve building performance, and we continue to strive to increase its efficiency in the future."

Among the eight addenda that are identified as having a major positive impact on energy efficiency, IES notes that three are attributed to lighting changes according to Rita Harrold, IES director of technology. These address control requirements for lighting alterations, additional controls for more spaces with a shortened time to lighting reduction or shutoff, and a decrease in lighting power density in most building types to reflect changes in revisions to illuminance recommendations in the IES Lighting Handbook, 10th edition.

The DOE noted that the 2013 standard contains 52 positive impacts on energy efficiency that were incorporated into the analysis. These impacts included changes made through the public review process in which

users of the standard comment and offer guidance on proposed requirements. Specifically the major positive impacts include:

- Control requirements for lighting alternations
- New requirements for individual fans
- Reduction of energy usage for large boilers
- Reduction of fan energy usage
- New efficiency requirements for commercial refrigeration
- More controls in more spaces and reduction of time to reduction or shut off of those controls
- Reduction of lighting power density in most building types

Hitachi Air Conditioner Features 3D Camera

Hitachi of Japan has recently unveiled not one, two, or even three, but nine (yes, nine!) different models of air conditioners for the masses, where these happen to be the 'Stainless Clean Shirokuma-kun X series' that will also see a "living camera 3D" installed. These days, when we talk about a 3D camera, we might think of something that has to do with movie making or the equivalent, but this particular air conditioner line from Hitachi is far removed from such an idea.

In fact, the living camera 3D will comprise of three different parts, where there will be an "image camera" that is capable of knowing a particular position in the room where a person is sitting down at, while a "thermal camera" is smart enough to make an estimate of the temperature of the person as well as surrounding ambience, while a newly included "things camera" is capable of figuring out floor plan, position and shape of furniture within the room.

As for the "things camera", it will be equipped with a near Infrared LED that will help filter images to the camera via infrared transmission. This allows the air conditioner to enable the warm air blow without having to be blocked by furniture, in order to reach the feet of the person.



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Professional Development Hours

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ASHRAE monthly meetings!



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Business Card	\$10.00	\$50.00
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ASHRAE Region IX Dinner Chicago Winter Meeting

During the Winter and Annual Meetings we typically get together as a Region for dinner one night. This has traditionally been on Monday evening due to other ASHRAE events. For this year's Winter Meeting in Chicago we are going to try and do something a little different and have the Regional Dinner on Sunday evening and it is a little later than normal. This is open to anyone in the region, so please pass this information on to the members of your chapter. This is an 11 minute walk (according to Bing) from the Palmer House. For those leaving from the Palmer House, we will meet in the lobby around 7:30pm and we will leave promptly 7:45pm.

Region IX Dinner

Date: **Sunday, January 25th**

Time: **8:00pm**

Location: Giordano's
223 W. Jackson Boulevard
Chicago, IL 60606
(312) 583-9400

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