



Central Oklahoma Chapter

ISSUE 6 - March
2013-2014 EDITION

Sou'Wester

Monthly Newsletter of the Central Oklahoma Chapter



Chapter President
David Royal

The next time you are looking for technical information on a HVAC related topic you may want to consider visiting the [ASHRAExCHANGE](#). The xCHANGE is a new forum on ASHRAE related topics (IAQ, BIM, Government Affairs, etc.).

Also, consider subscribing via RSS to our Central OK Chapter [blog](#). We've been updating it almost weekly.

GOVERNMENT AFFAIRS: Last month Congress gave final approval to, and President Barack Obama signed, the Agricultural Act of 2014, commonly known as the Farm Bill ([H.R.2642](#)).

UPCOMING EVENTS

April Meeting

April 2nd at 50 Penn Place in 3rd floor retail space

11:30am Lunch (\$20 at the door)

12:00pm Improving Sound Performance in Classroom Environments - Distinguished Lecturer Dr. Lily Wang is an Associate Professor and Program Coordinator of the Architectural Engineering Program within the Durham School of Architectural Engineering and Construction at the University of Nebraska – Lincoln.

1:00pm Wrap-Up

Continued on Page 2

Continued from Page 1

The Farm Bill is a sprawling 357 pages, covering a wide range of areas – among them, building energy efficiency. In this area, the bill will require the U.S. Department of Agriculture (USDA) to submit a report to Congress that contains:

- An analysis of energy use by the USDA headquarters and major regional facilities.
- A list of energy audits that have been conducted at such facilities.
- A list of energy efficiency projects that have been conducted at such facilities.
- A list of energy savings projects that could be achieved with enacting a consistent, timely, and proper mechanical insulation maintenance program and upgrading mechanical insulation at such facilities.

The ASHRAE Grassroots Government Affairs committee has established a [Facebook](#) page if you're interested in industry-related legislation and regulations coming out of Washington.

ASHRAE RESEARCH: One of the more important tasks we perform each year is helping collect funds for the ASHRAE Research Promotion fund. If you have donated in the past, Adam Shupe or someone from his committee will be contacting you shortly asking you to renew your investment in ASHRAE research.

At the Winter Meeting in NYC, The University of Oklahoma was awarded \$237,346 for perform research on research project 1399-TRP: *Survey of Particle Production Rates from Process Activities in Pharmaceutical and Biological Cleanrooms*.

There is currently \$750,000 of research being conducted @ OSU & OU that is being funded by ASHRAE.

MEETING UPDATE: Our May 7th meeting will be a joint meeting with the OKC Chapter of PHCC. Our speaker will be Jerry King, with the City of OKC Inspections Services Department, on the recent Mechanical Code changes.

David Royal

ASHRAE Central Oklahoma Chapter President

Spring is coming!

I know it seems like it never would.



Job Opening:

Frankfurt-Short-Bruza has immediate openings for Mechanical Engineers and Designers of all experience levels.

Some of the benefits of working at FSB include:



- Competitive salary and extensive benefits package, which includes medical, dental, vision, basic life, short term and long term disability benefits
- Opportunity to work on diverse local, national, and international projects
- Opportunity to gain experience designing a wide range of HVAC systems
- We provide a collaborative, creative environment where each person feels encouraged to contribute to our processes, decisions, planning and culture
- Training and support in obtaining PE License

If you are an individual who would like to join a progressive company that offers a positive working environment, send your resume and salary history to employment@fsb-ae.com. Salary is commensurate with experience and professional licensure.

FSB is an Equal Opportunity/Affirmative Action Employer.

Paintball—It's on!

Ever wanted to shot a vendor, competitor, friend, now you have your chance. YEA is putting together a paintball event at the end of the month and we need you to come out and participate. If you are interested in joining us for this or just want more information, please contact Michael Wilson—michael.wilson@guernsey.us.



YEA

By Michael Wilson

Happy Hour at Republic GastroPub on February 28th was fun, and we had a great time sharing stories and ideas with each other. Thanks to Guernsey for sponsoring! Remember these events are a great place to meet new people and expand your network. Next month we are planning paintball at Avid Extreme Sports Park in Guthrie. It is tentatively scheduled for Friday, March 28th at 2 pm. Keep an eye out for an invite if you have not already seen it. If you would like to help sponsor this event or future YEA events, please let me know. If you would like more information about YEA, please contact me or go to www.ashrae.org/YEA.

Michael Wilson can be reached at 405-416-8373 or michael.wilson@guernsey.us.

ASHRAE Spring Online Courses Cover Significant Updates to 90.1-2010, Career Enhancement

ATLANTA – Expert knowledge of sustainable techniques is in demand and the 13 online courses being offered this spring through the ASHRAE Learning Institute (ALI) allow professionals to keep up with the latest industry trends.

Participants can access these instructor-led courses from anywhere with an Internet connection, and earn continuing education units/professional development hours for each course completed.

New this spring is the short course “Significant Changes to Standard 90.1-2010,” on May 14. This course provides an in-depth overview of the standard and answers questions about changes from previous editions in envelope, lighting and mechanical sections.

“90.1-2010 represents the biggest change in the standard since it became a code document in 1999,” Mack Wallace, course instructor, said. “The 2010 standard contains over 100 changes from the 2007 version and decreases energy use in buildings by around 30 percent as compared to buildings built to the 2004 standard.”

Additionally, 90.1-2010 was recognized by the Department of Energy as the new national energy standard, meaning that the numerous jurisdictions are beginning to adopt the standard.

“Each of the states will be required to adopt some form of 90.1 for use on commercial buildings” Wallace said. “The focus of these government organizations will now move to compliance with the standard. All building design professionals will need to be familiar with the new standard as it becomes law.”

The course also is part of ASHRAE’s Career Enhancement Curriculum, which focuses on IAQ Practices and Energy Savings (ES) Practices. The program is a new way to help professionals expand their knowledge in specific areas of HVAC&R and advance their careers.

The courses offered this spring cover a variety of topics relevant to today’s built environment, including:

- **Commissioning**
 - “Commissioning Process in New and Existing Buildings, Parts 1 & 2” (March 26, April 2)
- **Environmental Quality**
 - “IAQ Best Practices for Design, Construction and Commissioning” IAQ Practices (May 1)
 - “Troubleshooting Humidity Control Problems” IAQ Practices (March 24)
- **Energy Efficiency**
 - “Commercial Building Energy Audits, Parts 1 & 2” (April 28, 30)
 - “Basics of High-Performance Building Design” (May 8, 2014)
 - “Energy Modeling: Best Practices and Applications, Parts 1 & 2” (May 5, 12)
 - NEW “Evaluation Methods for High-Performance Green Buildings” (May 7)
- **HVAC Applications**
 - “Introduction to BACnet®” (April 14)
 - “Designing High-Performance Healthcare Facilities” (April 23)
- **Standards & Guidelines**
 - “Complying with Standard 90.1-2013, Parts 1 & 2” ES Practices (April 7, 9)
 - “Fundamentals and Application of Standard 55” [IAQ Practices](#) (March 31)
 - “Fundamental Requirements of Standard 62.1-2013” [IAQ Practices](#) (March 12)
 - NEW “Significant Changes to Standard 90.1-2010” [ES Practices](#) (May 14)

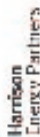
ALL courses provide professional development through in-depth information that is timely, practical and advanced beyond a fundamental level. Courses are offered every spring and fall.

For pricing or to register, visit www.ashrae.org/onlinecourses.

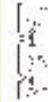
ASHRAE, founded in 1894, is a building technology society with more than 50,000 members worldwide. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability. Through research, standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow’s built environment today.

Thank you to our Sponsors!

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VIP Host Bill Harrison

Conference Locations



2014

Region VIII CRC

April 24-26

Little Rock, AR



Hosted By



2014 CRC Agenda

Wednesday, April 23

4:00 pm—7:00 pm | Registration
Hotel Lobby Balcony

Thursday, April 24

7:00 am—6:00 pm | Registration
Hotel Lobby Balcony

7:00 am—6:00 pm | Hospitality Suite Open
Room Number TBD | Companions Welcome

8:30 am | Golfers Meet
Hotel Lobby

10:00 am | Golf Outing
Maumelle Country Club
100 Club Manor Dr | Maumelle, AR 72113

4:00 pm—5:00 pm | Caucus Orientation
Hoffman Room

6:00 pm—9:00 pm | Welcome Party
Companions Welcome

Arkansas Museum of Discovery
500 President Clinton Ave | Little Rock, A.R.

8:00 pm—?? | VEA After Party
Coordinated by ASHRAE Arkansas YEA
Sonny Williams Steak Room
500 President Clinton Ave | Little Rock, A.R.

Friday, April 25 | Companion Outing

11:00 am | Depart for Tour

11:30 am—2:00 pm | Lunch and Sightseeing
Mark Twain Paddleboat

Friday, April 25

7:00 am—5:00 pm | Registration
Hotel Lobby Balcony

6:45 am—7:45 am | Caucus Breakfast
Lafayette Room

7:00 am—6:00 pm | Hospitality Suite Open
Room Number TBD | Companions Welcome

8:00 am—11:45 am | Business Session
10:00 am—10:15 am | Break
Statehouse Convention Center Ballroom C

12:00 pm—1:45 pm | President's Luncheon
Statehouse Convention Center Ballroom B

2:00 pm—5:00 pm | Technical Sessions
Harris Break

2:00 pm—3:15 pm | Ed Tinsley, TME, Inc.
"Retro-Commissioning Healthcare Facilities"

3:45 pm—3:50 pm | Break

3:30 pm—4:45 pm | Richard Royal, Walmart
"Refrigeration Design"

6:00 pm—9:00 pm | Friday Night Social
Companions Welcome

Clinton Presidential Center
1200 President Clinton Ave | Little Rock, AR

Saturday, April 26

7:00 am—12:00 pm | Hospitality Suite Open
Room Number TBD | Companions Welcome

7:00 am—12:00 pm | Registration
Hotel Lobby Balcony

7:00 am—7:45 am | Newsletter Judging
Peck Room

8:00 am—9:45 am | Workshops
Webmaster/Electronic Communications | Lafayette Room
Chapter Operations | Neocho Room

Research Promotion | Grampas Room
Historian | Petit Jean Room
CTTC | Chicot Room

Grassroots Governmental Affairs | Ouachita Room

8:00 am—11:45 am | Golden Gavel Committee
Riverview Room

9:45 am—10:00 am | Break

10:00 am—11:45 am | Workshops

Refrigeration | Lafayette Room
Student Activities | Neocho Room
Newsletter | Grampas Room
Membership | Petit Jean Room
Chapter Treasurer | Chicot Room
VEA | Ouachita Room

12:00 pm—1:45 pm | Awards Luncheon
Companions Welcome

Statehouse Convention Center Ballroom B

2:00 pm—3:30 pm | Business Meeting

Statehouse Convention Center Ballroom C

3:30 pm—5:00 pm | Executive Session
Statehouse Convention Center Ballroom C

3:30 pm—5:00 pm | CRC Debrief
Marion Room

Saturday, April 26 | Companion Activities

10:00 am—12:30 am | Chair Massages & Painting
Hospitality Suite

CHAPTER MEETING MINUTES

February 5, 2014

50 Penn Place
Oklahoma City, OK

President Royal called the meeting to order at 11:40 AM.

Alan Loeffler delivered the invocation.

Alan Loeffler (Historian) delivered his history minutes from the chapter documents he has been reviewing . He tied an even 100 years ago to the meeting we were having that day.

Brett Smith, Senior Regional Manager, AAON presented on single zone VAV systems. He compared the psychometric controls of standard RTU controls to more advanced controls. He showed clear performance improvement for single zone VAV by incorporating a VFD or ECM on the supply fan and a digital scroll on one or all compressors. Hot gas reheat showed the best potential for room control, but was not included in the energy analysis. Hot gas bypass was shown to be an energy looser, but gave improved room control. Adam Shupe asked “tough” questions at the conclusion.

There was no new business.

The meeting was adjourned at 12:40 PM.

CHAPTER MEETING MINUTES

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There was no new business.

The meeting was adjourned at 12:40 PM.

**ASHRAE Central Oklahoma Chapter Board of Governor's
Meeting Minutes: January 27th, 2014**

President David Royal called the meeting to order at 11:35 PM

Attendees:

Chapter Officers Present: David Royal, President, Joe Sanders, President Elect, Shaun Sexton, Treasurer, John Semtner, Secretary

Board of Governors Present: Jason Keyes, Dusty Stoabs, Mark Fergason, Stephanie Thomas, Michael Wilson, Daniel Brazeale, Grant Flurry

Absent: Tim Jones, Rick Marsh, Brian Sauer

Members Present: Alan Loeffler, Michael Wilson, Caleb Spradlin

Meeting Minutes:

Meeting Minutes from December 16th, BOG meeting was presented.

Jason Keyes made a motion to accept, Mark Furgason second. Report approved.

Treasurer's Reports: Shaun Sexton verbally presented his report.

President's Report:

David Royal presented his report.

VP Training will be held February 8th. Joe Sanders and David Royal plan to attend.

CRC registration is now open. Res & VP will be delegates.

David reminded committee chairmen to update their PAOE pages directly.

We received a letter abating one IRS penalty and expect the second to follow.

Committee Reports:

Membership: N/A

Research Promotion: Adam Shupe – Drafting RP request emails. Currently at \$10,900 of 38,000 goal. Adam has awards from past years to distribute.

CTTC: Daniel Brazeale – Has PDH certificates to distribute by email. May meeting needs to be secured with Jerry King. April Webcast needs 3 locations.

Government Affairs: David Royal discussed meeting with Chad Smith (Tulsa) and Byron Hughes.

History: Alan Loeffler – Progressing through photos with Harry.

Student Activities: Caleb Spradlin – 5 OU & 1 OSU student attended winter conference. Budget for \$500 in travel reimbursement available if students present on trip. Donated \$350 to Future City for the ASHRAE indoor air quality prize

YEA: Michael Wilson is planning a paintball outing next month (Proposed Feb 23rd)

No other new business

President David Royal adjourned the meeting at 11:55 pm

Next BOG meeting will be on 02/24 at 11:30 AM.

BOARD OF GOVERNORS CONTACT INFORMATION

Officer Name	Role	Company	Phone	Email
David Royal	President	Automated Building Systems	(405)948.1749	David.royal@abscompanies.com
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Adam Shupe	Research Promotion	Burns McDonell	(405)200.0306	ashupe@burnsmcd.com
Bryan Garcia, P.E.	Webmaster Special Events Newsletter	Trane Company	(405)717.7614	bdgarcia@trane.com
Caleb Spradlin	Student Activities	TME, Inc	(405)463.6570	cspradlin@tme corp.com

Upcoming Meetings and Events

Date	Event	Topic	Presenter
11/6	November Meeting	BIM Storm OKC	FSB BIM Team
12/4	December Meeting	Insuring Energy Efficient and Healthy Buildings— Effective Control of Outside air	Peter Hmelyar, Aircuity
1/8	January Meeting	HVAC Acoustics Strategies for Indoor and Outdoor Applications	Brandon Wallace, BRD— Noise and Vibration Control, Inc.
2/5	February Meeting	Single Zone VAV	Brett Smith, Aaon
3/5	March Meeting	Liquid Desiccant AC Technology	Trevor Wende, Advantix Systems
4/2	April Meeting	Acoustics that make the Grade, Improving Sound Performance in Classroom Environments	Lily Wang, Distinguished Lecturer
5/7	May Meeting	Recent Mechanical Code Changes	



Javad Khazali

Performing Probabilistic Energy Modeling

BY JAVAD KHAZALI, PH.D., P.E., MEMBER ASHRAE

In my November column, I discussed the necessity of performing a probabilistic energy modeling process instead of a deterministic one for an ASHRAE/IES Standard 90.1, Appendix G, design building. To be able to run a probabilistic energy model, the first step is to develop a tolerance margin library for all the construction material that would be used in constructing a building and for its associated equipment.

Clarke, et al.,¹ have developed a considerably strong data source in which they have depicted the uncertainty that resides in thermal properties within a handful of construction materials. This data can be used to begin generating a comprehensive library of the uncertainties.

AHRI standards provide manufacturing allowable test tolerances for most HVAC equipment that can be used as a source of uncertainty evaluation in the equipment. For example, ANSI/AHRI Standard 430-2009, *Standard for Performance Rating of Central Station Air-Handling Units*, allows the tested brake horsepower of the fan to be as high as 107.5% of the nameplate, and AHRI Standard 550/590-2011, *Standard for Performance Rating of Water-Chilling and Heat Pump Water-Heating Packages Using the Vapor Compression Cycle*, allows a tolerance of $[0.105 - (0.07 \times \text{Percent Load})] + [0.15 / (\text{Chilled water temperature difference}) \times \text{Percent Load}]$ for centrifugal chillers. This implies that the actual air-handling unit and chiller power consumption could fall in a margin between the nameplate (deterministic energy model input) and the maximum allowable test tolerances.

In addition, allowable tolerances for consumed power by lighting and appliances should be derived from the proper resources to make sure the majority of the existing probabilities have been considered.

Another source of uncertainty that is worthy of evaluating is the effect of accuracy of different sensors throughout the network of the HVAC system. For example, temperature sensors located inside the occupied room or at the cooling coil leaving air position usually are set to 75°F or 55°F (24°C or 13°C), respectively. Generally, each sensor has an allowable tolerance of 0.5°F (0.28°C). Also, a temperature sensor located outside the building as a measuring reference of the outdoor air temperature usually has a 1°F (0.55°C) tolerance. These tolerances can contribute to the total uncertainty in the output of the energy model as well. This evaluation also can be useful for validating the use of micro-electro-mechanical systems (MEMS) sensors in HVAC applications due to their smaller accuracy margins in comparison with the currently used sensors in the buildings and its systems.

After gathering a comprehensive library of the associated uncertainty margins for construction materials and equipment, the next crucial step is to assign proper probability distribution to each of these uncertain input data. This requires collecting manufacturing data, studying the data and, finally,

Javad Khazali, Ph.D., P.E., is an associate engineer with Newcomb & Boyd Consulting Engineering Group in Atlanta.

allocating proper probability distributions to each item based on the studied data. Probability distribution should express how the construction material, HVAC equipment, lighting, appliances, and sensors' possible selected

occurrences are expected to be distributed inside the tolerance margin of each item. Probability distributions such as uniform, normal, and lognormal are a few samples of probability distributions that should be assigned to

each uncertain input value based on the collected data. This is probably the most critical and also most demanding part of this procedure.

The next step is work that really falls on the shoulders of the software developers. What software developers need to add to their current commercial deterministic simulation programs is the capability to randomly select each input from its probability distribution curve, then stay on the selected curve throughout the full (one) run of the simulation, and generate the (one) output, based on random selection of all the input components.

Simulation should be repeated based on different random selections from the library collection (usually between 80 to 500 times), and the probability distribution of the output shall be generated based on the results of all the performed simulations. That depicts the possible range and its percentages of **occurrences of the final output or** the building energy consumption (cost). Such approaches in statistics are known as the Monte Carlo Simulation, or Latin Hypercube Sampling, which are common sampling simulation methods.

References

1. Clarke, J.A., P.P. Yaneske, A.A. Pinney. 1990. "The Harmonisation of Thermal Properties of Building Materials." BRE Publication; BEPAC Research Report. <http://tinyurl.com/2b7q5bm>. ■

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