

# ASHRAE Rochester



VOLUME 8, ISSUE 5

JANUARY 2014

## INSIDE THIS ISSUE:

Officer / Committee List	2
Events Calendar	3
President Msg	4
December Meeting Recap	5
Job Postings	6
Membership Pro- motion Message	7
Technology Awards	8
Student Activites Message	9
Valentine Dinner Dane	10
Bellenger Book Corner	13
Student Applica- tion	14
Board of Gov. Meeting Minutes	16
ASHRAE Scholarships	19
Learning Opportunities	20
Winter Confer- ence Info	24
Society News	28



You are cordially invited to the

## 57th Annual Valentine Dinner Dance

Hosted by ASHRAE Rochester

Friday, February 7, 2014

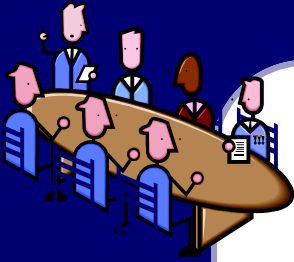
Colgate Rochester Crozer Divinity School  
1100 South Goodman Street  
Rochester, New York

7:00pm Reception - Hors d'oeuvres & cocktails  
8:00pm Dinner - As you select  
9:15pm Dessert, Coffee and Dancing

**Menu Selections**  
8 oz beef filet with burgundy reduction  
Asian seared salmon  
Chicken french  
Wild mushroom roasted tomato pastry



*(refer to pages 10-12 for more details)*



## Chapter Officers

### President

Robert J. Wind, Jr. PE  
585-341-3172  
rwind@ibceng.com

### President Elect

Edward J. Burns  
585-739-7548 / 872-9172(fax)  
ejb@mechtechhvac.com

### Vice President/Tech

Christina Walter  
585-486-2148  
cmwalter@trane.com

### Secretary

Jeff Close, PE  
585-289-6816 / 218-0737(fax)  
jeff.close@pres-services.com

### Treasurer

William J. Clark  
585-303-0729  
william.clark@DayAutomation.com

## Committee Chairs

### CTTC / Programs

Jeff Wiedrick 585-232-5137 x354  
jwiedrick@bergmannpc.com

### CTTC / TEGA

Tom Burke  
amtburke@yahoo.com

### CTTC / Refrigeration

Michael Nohle 585-216-9016  
mikenohle@aol.com

### Historian

Lee Loomis 585-262-2870/262-4156(fax)  
leeloomis46@gmail.com

### Membership

Jake Hall 585-869-5125  
jhall@proairplus.com

### YEA

Matt Kremers 585-398-8018  
mkremers@mcsmms.com

## Board of Governors

Jim Browe (3)  
585-697-0836  
jbrowe@rfpeck.com

Beth Smith (3)  
585-272-0110  
bsmith@vpsupply.com

Eric Smith (2)  
585-381-3360  
esmith@turnerengineering.com

Paul Kenna, PE (2)  
585-295-3114  
Paul.Kenna@carrierenterprise.com

Scott Edwards (1)  
585-486-2156  
scott.edwards@trane.com

Mike Benedict (1)  
585-490-2661

### Student Activities

Chris Lukasiewicz 585-381-3360  
clukasiewicz@turnerengineering.com

### Newsletter Editor

Scott Edwards  
scott.edwards@trane.com

### Attendance & Reception

Timothy Duprey 585-205-0073  
dupreyt@ifsinc.net

### Building Simulation User's Group (BSUG)

Bill Bishop 585-325-6004  
wbishop@pathfinder-ea.com

### Research Promotion

Paul Kenna 585-295-3114  
Paul.Kenna@carrierenterprise.com

### Webmaster

Kevin Wind 585-263-1280  
kwind@rochester.rr.com

ASHRAE 2013-2014 Meeting Schedule				
Date	Event	pdh / Theme	Location	Schedule
01/13/14	NYS Building Department NYS Code Updates and Changes NYS Energy Conservation Code/ NYS Mechanical Code		Mario's	12:00 PM
02/07/14	Annual ASHRAE Valentines Dinner Dance	---	Colgate Rochester Crozer Divinity School	7:00 PM
02/10/14	Joint Meeting with AEE	Available	Mario's	12:00 PM
03/10/14	Jerry M. Sipes, Ph.D., P.E. Fundamentals of Displacement Ventilation	Available	Mario's	12:00 PM
04/07/14	Refrigeration Tour Wegmans East Ave. - CO2 Refrigeration System		TBD	TBD
05/12/14	Annual ASHRAE Golf Outing and Picnic	---	Ravenwood Golf Club	9:30 AM Golf 4:30 - 8:00 Picnic

## Mission Statement

ASHRAE will advance the arts and sciences of heating, ventilation, air conditioning, refrigeration and related human factors to serve the evolving needs of the public and ASHRAE members.



Shaping Tomorrow's  
Built Environment Today

## Vision Statement

- will be the global leader in the arts and sciences of heating, ventilation, air conditioning and refrigeration.
- will be the foremost, authoritative, timely and responsive source of technical and educational information, standards and guidelines.
- will be the primary provider of opportunity for professional growth, recognizing and adapting to changing demographics, and embracing diversity.

## President's Message

On behalf of the Rochester Chapter Board of Governors, I hope everyone had a safe and happy holiday. Welcome to 2014! It is customary at the new year to look back on the past and make plans for the future. Along that lines, please reflect on the projects you have worked on in the past year. If there are any that were interesting or of particular challenge, please take the time to consider submitting them for an ASHRAE technology award. Jeff Wiedrick can be contacted for assistance if needed to determine what category fits your project best. Check out the website at <http://rochester.ashraechapters.org> and find his contact information under the Chapter Information Tab – Committees.

Mark Kukla, our publicity chairperson, has set up a Facebook page for ASHRAE – Rochester. It is set up to give you information about the chapter and is linked to allow you to sign up for meetings. If Facebook is your preferred method of communication, please take a moment to “like” us.

Lastly, Jeff Ellis is the chairperson for the nominating committee. If you have an interest in selecting candidates for the future board of ASHRAE – Rochester, please contact him through the website. He is also looking for candidates for the board. If you feel that you or someone you know would make a good board member, please let him know.

Remember that the Chapter Board is here to provide the best chapter possible to you. If there is something that you need or would like to see, please let myself or one of the other board members know. Thanks and have a good new year.

*Rob Wind, PE, 2013-2014 President*

# VRF Headlines Rochester ASHRAE's December Meeting

Monday December 9th was the ASHRAE Rochester Chapter monthly meeting held at Mario's Restaurant with the topic on "Variable Refrigerant Flow and ASHRAE 15", led by Marty Brinton. ASHRAE 15 was discussed, as well as design considerations, including system layout, and how much refrigeration is required for a system.



January's Meeting will be Monday the 13th, also at Mario's, 12pm. The topic will be on Mechanical & Energy Code Updates as found in the New York State Building Standards & Codes, led by Charles Bliss (New York State Department).

Remember, as an option, we now have on-line payments available via PayPal.

<< **Pay for Meeting Registration online via PayPal (no PayPal account required)** >>  
Use the following link: <http://rochester.ashraechapters.org/meetings.html>

Cash or check payment still accepted at the door with your reservation.

Please RSVP no later than noon Friday, January 10<sup>th</sup> to Tim Duprey  
Phone: 585.205.0073 or e-Mail ... [dupreyt@ifsinc.net](mailto:dupreyt@ifsinc.net) ... [tduprey@rochester.rr.com](mailto:tduprey@rochester.rr.com)

Respectfully,  
*Tim*

**Attention Members:**

Just a reminder that all members that reserve a spot for the monthly meeting will be responsible for that reserved space.

Members have until 12:00 pm the day of the RSVP deadline to cancel their meeting reservation.

Failure to comply with this rule will result in the attendee being responsible for the payment of that reservation.

ASHRAE Rochester Chapter Officers



Although there are no job posting for this month's newsletter, this section of the newsletter is reserved for those firms wishing to advertise their desires to hire from the Chapters Membership.

If you are interested in utilizing this FREE service provided by the Rochester Chapter, please contact our Chapter President, Rob Wind (585.341.3172) or by email [rwind@ibceng.com](mailto:rwind@ibceng.com).

This service is available to ASHRAE members for any local firm in our industry looking for knowledgeable persons in the HVAC&R industry.

---

## Like us on Facebook!

Visit our new Facebook page by searching for "ASHARE Rochester" on Facebook. Any ideas for additions or improvements email to Mark Kukla at [mark@airsystemsbalancing.com](mailto:mark@airsystemsbalancing.com). Keep up to date with current events and photos from recent meetings.

# Rochester Chapter

## Committee Chairs Updates

### Membership

#### ASHRAE Rochester Chapter- Membership Promotion

Just a quick reminder, please be checking your annual renewal date for membership. This year there is a lot of focus on membership retention and reducing the number of delinquent members that we have in chapter. We are doing a great job so don't forget to renew as we head into this busy season. Also, remember to attempt to do as much of our Membership Renewals and New Member Applications online to decrease the amount of paperwork for the Society and make the process "Greener." If you have any questions or need assistance with any Membership Issues, please let me know.

Thank you, and as always, thank you for your support for ASHRAE.

Happy Holidays!

Sincerely,

Jake Hall

## 2013-2014 Presidential Award of Excellence Summary

Chapter #	Chapter Name	Chapter Members	Member Promotion	Student Activities	Research Promotion	Chapter Technology Transfer	History	Chapter Operations	Chapter PAOE Totals
11	Rochester	239	200	0	285	0	0	0	485



# Technology Awards

## Technology Awards

The deadline for Chapter level ASHRAE Technology Awards is fast approaching. ASHRAE Technology Awards recognize outstanding achievements by members who have successfully applied innovative building design in the areas of occupant comfort, indoor air quality and energy conservation.

Awards are presented in six categories for new and existing facilities and are judged on the merits of Energy Efficiency, IAQ and Thermal Comfort, Innovation, Operation and Maintenance, Cost Effectiveness, Environmental Impact and Quality of Presentation.

Chapter level award applications require only a one page application, a schematic and a short narrative.

First place winners in each of the six categories at the chapter level will be submitted for judging in the regional awards competition.

Awards are intended for built projects and as such must have been occupied prior to September 1<sup>st</sup>, 2013 to be eligible.

The following link includes additional details about the awards program:

<https://www.ashrae.org/membership--conferences/honors--awards/technology-awards-program-overview>

Please consider representing the Rochester Chapter of ASHRAE by submitting your project to the chapter for consideration before **April 1, 2014**. Email [jwiedrick@bergmannpc.com](mailto:jwiedrick@bergmannpc.com) with any questions, to receive an application form, for a sample application or any other concerns.



# Student Activities

## STUDENT ACTIVITIES



### Do you know the benefits of being an ASHRAE Student Member?

- **Monthly ASHRAE Journal** exploring issues such as indoor air quality, energy management, solar developments, and more.
- **ASHRAE Insights** monthly newspaper devoted to news and information about the Society at every level including news of special interest to students.
- **The HVAC&R Industry eNewsletter** for weekly industry news and information.
- **SmartStart Program** to ease into full membership dues over a three year period after graduation.
- **Opportunities** to participate in the Student Design Project Competition, Grants-in-Aid, Society and Local Scholarships, and Student Branch Activities.
- Access to **The Student Zone** web page which offers valuable career and educational resources.
- **ASHRAE Publication Discounts** at the ASHRAE Student Store including ASHRAE books, standards, reports, charts, and more.

### Do you know anyone that could benefit from being an ASHRAE Student Member?

- Join over 5,000 other students taking advantage of ASHRAE benefits today at <https://ashrae.org/membership--conferences/join-now>.

### Visit the Student Zone at <https://ashrae.org/membership--conferences/student-zone> to learn about:

- Design Competition
- Scholarships and Grants
- New Faces of Engineering – College Edition
- K-12 Activities
- Membership Benefits and Meetings
- Educational Resources
- Student Activities
- Student News
- Student Branches
- ASHRAE's SmartStart Program



You are cordially invited to the

# 57th Annual Valentine Dinner Dance

Hosted by ASHRAE Rochester

Friday, February 7, 2014

Colgate Rochester Crozer Divinity School  
1100 South Goodman Street  
Rochester, New York

7:00pm Reception - Hors d'oeuvres & cocktails  
8:00pm Dinner - As you select  
9:15pm Dessert, Coffee and Dancing

### Menu Selections

8 oz beef filet with burgundy reduction  
Asian seared salmon  
Chicken french  
Wild mushroom roasted tomato pastry



For reservations, please mail or fax this registration form by January 31, 2014.

Make checks payable to Rochester Chapter ASHRAE and mail to:

Jody McGarry  
ABR Wholesalers, Inc.  
510 North Goodman Street  
Rochester, New York 14609  
Phone (585) 482-3601 Fax (585) 482-6698

Name: \_\_\_\_\_ Beef · Chicken · Fish · Vegetarian

Name: \_\_\_\_\_ Beef · Chicken · Fish · Vegetarian

Number of people \_\_\_ x \$65\* per person = \$ \_\_\_\_\_ (enclosed)

\*Special price of \$50 per person for members of the Y.E.A.



# ASHRAE

*Technology for a Better Environment*

November 18, 2013

Dear ASHRAE Members,

On Friday, February 7, 2014, ASHRAE will be hosting its 57th Annual Valentine Dinner Dance at the Colgate Rochester Crozer Divinity School. ASHRAE is asking for your corporate support to donate \$325.00, billed to you as an advertising expense, to help defray the cost of this event. We know that it has been a challenging year, but your sponsorship will enable us to provide you with lively entertainment, a delicious meal, special desserts, and an evening with friends and colleagues you won't soon forget.

As always, we will be offering two complimentary dinners to corporate sponsors. Your sponsorship will be listed in the dinner program and dance flyers, as well as being listed in a full-page advertisement in the R.E.S monthly publication. You will certainly be recognized by your peers as an ASHRAE supporter.

An invoice is attached for your convenience. We thank you for your support and look forward to sharing this fantastic evening with you!

Very truly yours,

  
Jody McGarry  
Valentine Dance Committee

*American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.*

---

A N I N T E R N A T I O N A L O R G A N I Z A T I O N



# ASHRAE

Technology for a Better Environment

## Invoice

Advertising for February 2014 Promotion \$325

Please make check payable to: ROCHESTER CHAPTER ASHRAE and mail to:

Rochester Chapter ASHRAE  
c/o ABR Wholesalers, Inc.  
ATTN: Jody McGarry  
510 North Goodman Street  
Rochester, NY 14609

## Commitment

We would like to support the Rochester ASHRAE 2014 Promotion and agree to fulfill our commitment by March 1, 2014.

Company Name\_\_\_\_\_

Signed by\_\_\_\_\_

Date signed\_\_\_\_\_

Please return your check or commitment to ABR Wholesalers, Inc. Thank you.

***\*Don't forget...you will receive two complimentary dinners to attend our Valentine Dinner Dance!***

*American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.*

---

AN INTERNATIONAL ORGANIZATION

# Bellenger Book Corner

## WELCOME TO THE BELLENGER BOOK CORNER



Mrs. Lynn G. Bellenger was an avid reader and supporter of continuing education. She encouraged local firms to create internship opportunities for aspiring engineers in order for them to gain more experience.

Lynn had an extensive library collection of books ranging from introductory HVAC and hydronic systems to controls and energy efficiency manuals written by colleagues and friends that she had met through ASHRAE.

This section is dedicated in Lynn's honor to provide additional reading materials relevant to the ever-changing technology in the HVAC field. We hope this will be an especially valuable section for young engineers who are just starting their careers.

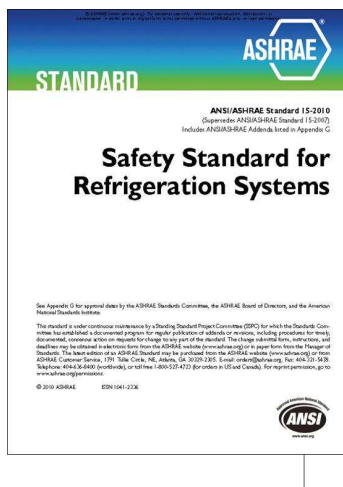
### DESIGNING VRF SYSTEMS

There are numerous reports & studies published on various AHSRAE Journals.

Check out ASHRAE's Bookstore website at:  
<http://www.techstreet.com/ashrae>

Type in "Designing VRF" in the Search window.

ASHRAE Standards 15 and 34 can also provide some direction to laying out and designing a VRF System while adhering to ASHRAE 15.



Also, there is a Technical Committee on VRF (TC 8.7) ... their website is: <http://tc87.ashraetcs.org/news.html>

If you know of a good manual that you would like to share with us, please send it to the newsletter editor Scott Edwards at [scott.edwards@trane.com](mailto:scott.edwards@trane.com). In order to keep with ASHRAE's goal of supporting continuing education without commercialization, we ask all reading materials recommended for this section be either ASHRAE sponsored or non-vendor specific.

The appearance of any technical data, editorial material or advertisement in ASHRAE.org or any of its electronic publications does not constitute endorsement, warranty or guarantee by ASHRAE of any product, service, process, procedure, design or the like. ASHRAE does not warrant that this information is free of errors and ASHRAE does not necessarily agree with any statement or opinion contained therein.





# ASHRAE Student Membership Application

## What You'll Get With Your ASHRAE Student Membership!

### What's "Cool" in ASHRAE

- ASHRAE promotes energy efficiency, savings and recovery
- ASHRAE reports on building controls, automation and integration
- ASHRAE focuses on green building issues and green technology
- ASHRAE maintains standards for indoor air quality
- ASHRAE promotes solar and other alternative energy sources
- ASHRAE offers certification programs, online learning opportunities and courses and seminars at ASHRAE Conferences

### How Can ASHRAE Help You?

- Provide access to new technology
- Offer professional development opportunities
- Create opportunities for networking
- Offer online continuing education programs and eLearning programs

### Student Member Benefits

- Access to members-only web pages
- Discounts on ASHRAE Handbooks
- Monthly ASHRAE Journal - print and digital
- HVAC&R Industry and Society Connections eNewsletters
- Complimentary ASHRAE Annual and Winter Conference registration (AHR Expo, Student Program, Technical Sessions)
- Virtual online HVAC&R resume posting, job and internship searching program

### ASHRAE Student Member Opportunities

- Society and chapter-level scholarships for both undergraduate and graduate engineering students
- Discounts for student members on select publications, go to [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore) for more information
- Student Design Competition
- Networking with local ASHRAE Chapters
- Senior Undergraduate Project Grant Program
- At the student branch level, you'll enjoy meeting other students with similar interests - if your school hasn't yet started a student branch, take charge and contact a faculty member and ask for help on getting started!

You can continue your student membership after college with the ASHRAE SmartStart Program. After you graduate, you pay \$20 for the first year, \$50 for the second and the third years before advancing to regular member dues!

**Join ASHRAE students on Facebook  
Visit [www.ashrae.org/students](http://www.ashrae.org/students) to join!**





FIRST NAME:

LAST NAME:

DATE OF BIRTH (mm/dd/yyyy)

Current Mailing Address: (this will be where all correspondence will be sent unless otherwise specified)

Street Address: \_\_\_\_\_ Apt. # \_\_\_\_\_ City: \_\_\_\_\_

State/Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_ Country: \_\_\_\_\_

Email: \_\_\_\_\_ Alternate email: \_\_\_\_\_ Phone: \_\_\_\_\_

Permanent Mailing Address: (during the Summer Months and after graduation)

Check if Current Address is the same as Permanent Address

Street Address: \_\_\_\_\_ Apt. # \_\_\_\_\_ City: \_\_\_\_\_

State/Province: \_\_\_\_\_ Postal Code: \_\_\_\_\_ Country: \_\_\_\_\_

Email: \_\_\_\_\_ Alternate email: \_\_\_\_\_ Phone: \_\_\_\_\_

ASHRAE protects contact information provided by its members and customers. To view ASHRAE's privacy policy visit [www.ashrae.org/privacy-policy](http://www.ashrae.org/privacy-policy).

All student applicants must have the name and member number of an ASHRAE member serving as their student sponsor. If your Student Branch Advisor is an active Associate or Full member, he/she can serve as your sponsor. If you need assistance locating a sponsor, please email [students@ashrae.org](mailto:students@ashrae.org) or call 678-539-1212. Also, you must list the name, phone and email address of your faculty advisor or course instructor.

Sponsor Name: \_\_\_\_\_ ASHRAE Member #: \_\_\_\_\_

Advisor/Instructor: \_\_\_\_\_ Phone: \_\_\_\_\_

Email: \_\_\_\_\_

To receive your subscription to the ASHRAE Journal, please answer the following questions by entering the appropriate codes in the spaces provided.

Which best describes your firm? \_\_\_\_\_

- 11. Consulting Engineering
- 12. Architect/Architectural & Eng Services
- 15. Design/Build
- 21. Contractor
- 26. Property Mgmt & Dev
- 31. Industrial Facility
- 41. Commercial Facility
- 42. Government, Healthcare, Education
- 43. Utility
- 51. Manufacturer/HVAC&R Equipment
- 61. Manufacturer's Representative
- 62. Sales Engineering
- 71. Wholesaler or Distributor
- 83. Library
- 84. Technical, Professional or Trade Association
- 86. Student \*\*\*
- 91. Other (Please Specify) \_\_\_\_\_

Which best describes your title? \_\_\_\_\_

- B. President
- C. Partner
- D. Associate
- E. Owner
- F. Vice President
- G. Vice President Eng. Chief Engineer
- K. Design Engineer
- L. Project/Application Engineer
- O. Facility Engineer/Manager
- P. Research/Development Engineer
- R. Sales Engineer, Sales
- S. Purchasing Agent
- T. Draftsperson
- U. Estimator
- W. Technician
- X. Instructor, Professor
- Y. Student \*\*\*
- Z. Librarian
- ZZ. Other (Please Specify) \_\_\_\_\_

ASHRAE Society Dues include \$6.00 for ASHRAE Journal. This amount is not deductible from Membership dues.

I would like to participate in the activities of the \_\_\_\_\_ ASHRAE Chapter.

School Name: \_\_\_\_\_

Street Address: \_\_\_\_\_ City \_\_\_\_\_ State: \_\_\_\_\_

Country: \_\_\_\_\_ Postal Code \_\_\_\_\_

Expected Graduation Date: \_\_\_\_\_

Full time:  Part time:  Degree: \_\_\_\_\_

\*Classification: Freshman  Sophomore  Junior  Senior  Masters/PhD.

ASHRAE Student Membership \$20.00 USD

ASHRAE Handbook - Fundamentals  IP  SI

(you will receive the most current edition of Fundamentals)

More than 900 pages of HVAC&R technical information and it includes the CD! (List Price \$195)

Student Member Price: \$49.00 USD \$ \_\_\_\_\_ USD

Total \$ \_\_\_\_\_ USD

\*Additional books are available at [ashrae.org/studentbookstore](http://ashrae.org/studentbookstore)

\*Please allow up to 30 days to receive new member packets. For U.S. book orders, allow 3-5 business days from processing. For international locations and Canada, allow 7-10 business days from processing.

\*\*Please complete the ENTIRE application to ensure accuracy. Incomplete applications will NOT be processed.\*\*

Method of payment:  VISA / Master Card  American Express  Diner's Club  Check or money order enclosed\*

Card Number: \_\_\_\_\_ Expiration Date \_\_\_\_\_ CW No: \_\_\_\_\_ Amount: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Print Name (as it appears on card): \_\_\_\_\_

\*Checks will be accepted in U.S and Canadian funds. Credit Card payments will be accepted in U.S. funds only.

# Board of Governors Meeting Minutes



## BOARD OF GOVERNORS MEETING MINUTES

Meeting Date: 12/4/2013

President	Robert Wind	X
President Elect/Program	Ed Burns	
Vice President-Tech Session	Christina Walter	X
Secretary	Jeff Close	
Treasurer	Bill Clark	X
Immediate Past President/CRC	Michelle Sommerman	X
Board of Gov. (1)	Mike Benedict	X
Board of Gov. (1)	Scott Edwards	X
Board of Gov. (2)	Eric Smith	X
Board of Gov. (2)	Paul Kenna	X
Board of Gov. (3)	Jim Browe	
Board of Gov (3)	Michelle Sommerman	X
Attendance	Tim Duprey	
Historian	Lee Loomis	
Membership Promotion	Jake Hall	
Newsletter Editor	Scott Edwards	X
Research Promotion	Paul Kenna	X
Awards	Al Rodgers	
CTTC	Jeff Wiedrick	X
Education	Bill Murray	
Publicity	Mark Kukla	X
Web Site	Kevin Wind	
YEA Chair	Matt Kremers	X
Student Activities	Chris Lukasiewicz	X
Nominating (2 <sup>nd</sup> Past President)	Jeff Ellis	
Picnic/Golf Chair	Jim Browe	
Buyers Guide	Stephanie Dempsey	
Valentine's Dinner Dance	Jody M. McGarry	
Refrigeration	Mike Nohle	

# Board of Governors Meeting Minutes

**Roll Call:** The above noted individuals were present.

**Call to Order:** 7:30am

**Minutes:** BOG Meeting Minutes previously approved via e-mail.

- **Treasurer's Report:** Bill Clark
  - Treasurer's report was reviewed and approved.
  - Money was transferred from PayPal account to checking account.
  - YEA budgeted money is still awaiting usage.
- **Program/Tech Session:** Ed Burns (not present) – no report.
- **Refrigeration:** Mike Nohle (not present) – no report.
- **Tech Awards:** Jeff Wiedrick
  - The deadline for the tech awards is in the spring.
  - Jeff to make an announcement at December general meeting.
  - An announcement should be put onto the website.
- **Membership:** Jake Hall (not present) – no report.
- **Attendance:** Tim Duprey (not present)
  - November meeting
    - No shows were high.
- **Awards:** Al Rodgers (not present) – no report.
- **Student Activities:** Chris Lukasiewicz
  - Spoke to Carl Lungren and nothing is going on until Spring.
  - ASHRAE may want to get involved in the Explorer's Job Program.
- **YEA:** Matt Kremers
  - Survey showed that members prefer monthly meeting with topics selected from a survey.
  - Still working on organizing a Fulton Boiler Plant Tour.
- **Research:** Paul Kenna
  - Donor recognition night is December. Paul will need a little time at December general meeting to acknowledge donors.
  - Society is asking for an increase of chapter donation from \$3000 to \$3,250.
  - So far 50/50 raffle has only brought in \$250 for research.
- **Newsletter:** Scott Edwards
  - RES deadline in 12/10/13.
  - Newsletter deadline is 12/20/13
- **Buyers Guide:** Stephanie Dempsey (not present) – no report.
- **Historian:** Lee Lomis (not present) – no report.

# Board of Governors Meeting Minutes

- **Website:** Kevin Wind (not present) – no report.
- **Nominating:** Jeff Ellis (not present) – no report.
- **Publicity:** Mark Kukla
  - Facebook is all set up. This should be announced at the meeting and in the newsletter.
  - Facebook page needs to be integrated better with the website.
  - Mark to work with Kevin to accomplish this.
- **Valentines Dinner Dance:** Jody McGarry (not present) – no report.
- **Old Business:**
  - CRC2016 (in Rochester) – no new report.
  - Regional visit – to be timed with membership promotion meeting.
  - Scholarship – no new report.
- **New Business:**
  - Rochester Engineering Symposium
    - 4/8/14 at Raddison.
    - Need 3 speakers and topics – Contact Michelle Sommerman.
- **Next Meeting:** Wednesday, January 8, 2014 at 7:30 AM located at Trane's office.
- The meeting was adjourned @ 8:05 am



#### Tips for ASHRAE Scholarship Applicants

##### Make sure ...

- You meet all applicable criteria
- You read the application carefully and answer all questions completely and honestly.
- The application and all required documents are submitted or postmarked on or before the applicable deadline.
- Your application is NEAT, legible (typed or handwritten clearly), and proper English (correct grammar and spelling) is used when responding to essay questions.
- To take time to submit a brief, non-required introductory cover letter
- You are clear and thorough when stating goals and financial need.
- You contact the nearest ASHRAE chapter for an interview with the Student Activities Chair or other officer to learn more about the Society.
- You find out if your school hosts an ASHRAE student branch.
- You contact ASHRAE headquarters if you have any questions and to ensure your application has been completed and submitted properly.

More information on the scholarship and details on how to apply can be found at [www.ashrae.org/scholarships](http://www.ashrae.org/scholarships).





*Your technical training provider presents...*  
**Air Conditioning Fundamentals 2014**

**Target Audience:** Essentially anyone who wants to broaden their base in fundamentals will greatly benefit.

- Any Direct or Indirect AM who has not had the opportunity to attend GTP
  - Perhaps a local new hire salesperson - that can't commit to 6-months at GTP
  - Someone who was promoted from within
  - A new hire that came from outside our industry
- Any BAS AE, PM, PA, Application Specialist or Estimator who wants to broaden their base in the fundamentals

**Primary Benefit:** Students will enjoy learning as much practical knowledge as possible about Air Conditioning Fundamentals. Students won't waste a great deal of time in theory. The typical student can immediately apply what he/she learns upon returning to their office. Past attendees have enhanced their overall confidence and found many ways to apply their recently acquired knowledge.

**Course Offerings (Rochester, NY):** (these classes are 3-days; Tuesday - Thursday)

- [ ] Jun 17-19 'Airside Fundamentals-II' (Duct Design, Fans & Fan Laws & Acoustics)
- [ ] Aug 19-21 'Systems Fundamentals' (HVAC Systems, Dehumidification, IceStorage-LowTempAir, Bldg Pressurization)

**Course Offerings (Harrisburg, PA):** (these classes are 3-days; Tuesday - Thursday)

- [ ] Feb 18-20 'Airside Fundamentals-I' (Load Design and Psychrometrics)
- [ ] Mar 18-20 'Refrigeration Fundamentals' (Refrig Basics, Refrig Piping, Refrig & Our Environment)
- [ ] Apr 15-17 'Energy Efficient Design Fundamentals' (Chiller-Side, Air-Side, System Controls, Energy Recovery, VRF)
- [ ] May 20-22 'Product Fundamentals' (AHU, WSHP, RTU, Chillers, Fan Coils, UV, VRF)

*Note: For more information about each of these classes, log onto [BeckerLearning.com](http://BeckerLearning.com)*

**Registration Deadline:** Each course will be filled on a first-come-first-reserved basis (established by receipt of payment).

**Contact:** Joe Becker, Becker Learning / 106 Needlewood Drive / Harrisburg, PA 17112  
Phone: (585) 317-0000 Email: [Joe@BeckerLearning.com](mailto:Joe@BeckerLearning.com)

**More Details for 3-day courses:**

**Where:** We will hold the 3-day classes at the local hotels listed below. These hotels will hold a block of rooms at the Becker Learning discounted price up until 15-days before the class - so please make your reservations right away. All you need to do is let them know that you are part of the Becker Learning group.

- \* Rochester, NY (Greece): Homewood Suites at 400 Center Place Drive, Rochester, NY 14615 - (585) 865-8534 at the Becker Learning rate of \$114/night
- \* Harrisburg, PA: The Holiday Inn Express at 4021 Union Deposit Road, Harrisburg, PA 17109 - (717) 561-8100 at the Becker Learning rate of \$103/night

**Time:** We will start each morning at 8:00 AM and end by 5:00 PM (except Thursday when we end by 4:00 PM for travelers)

**Food:** Lunch, mid-morning and mid-afternoon snacks & drinks are provided.

**What is not included:** Transportation, other meals & lodging.

**Travel: Arrival:** Since the seminar starts at 8:00 a.m., plan to arrive the night before.

**Departure:** You can book flights out of Rochester as early as 5:30 p.m. on Thursday since our Hotel is less than 10-miles from the airport. Harrisburg flights should be booked after 6:00 pm as the hotel is a bit farther (about 30-minutes) from the airport.



**Registration:** Please fill out this form for each person attending, and mail it along with a **Check** or **Purchase Order** (made out to 'Becker Learning') to:

**Becker Learning / 106 Needlewood Drive, Harrisburg, PA 17112**

**Payment Deadline:** Complete Payment must be received prior to the start of the class.

2014 Courses: Rochester, NY: <input type="checkbox"/> Airside-II <input type="checkbox"/> Systems	
(check all that apply) Harrisburg, PA: <input type="checkbox"/> Airside-I <input type="checkbox"/> Refrigeration <input type="checkbox"/> Energy <input type="checkbox"/> Products	
Name: _____	Title: _____
Trane Office: _____	
Address: _____	
Phone: (     )	Email: _____

Type	# of Courses	\$/course	Total Cost \$	Check # or PO #
3-day		\$1,100		

*Authorizing Person*

Printed Name	Signature	Date

**\*\*\*If a PO is given, full payment must be received prior to the first day of class.**

**Cancellation Policy:**

- If someone cancels 60-days prior to the start of the class => no cancellation charge.
- If someone cancels 30-60 days prior to the start of class => 50% cancellation charge
- If someone cancels less than 30-days before the start of class, or simply doesn't show up => charged the full amount

**Teaching Methodology:**

Similar to the way Joe taught nine classes in the Graduate Training Program of The Trane Company, students will learn a concept and then immediately apply this new knowledge with an application problem. Quiz/testing will also be used to measure the overall effectiveness of the teaching. In this way, the program receives continual improvement through direct feedback.

**About the Instructor:**

Joe Becker is a graduate of the University of Wisconsin-Madison with degrees in Naval Science and Industrial Engineering (1979). He is also a Graduate from the U.S. Naval Nuclear Power School at Mare Island, California (1975). Joe is a registered Professional Engineer (Wisconsin 1990).

After nine years in the Navy, Joe resigned his Commission in the Civil Engineer Corps. Since graduating from Trane's GTP class of 83-II, he worked as a Systems Engineer in C.D.S., Marketing Engineer in the Variable Air Volume Product Group, Manager of Technical Training in GTP, Sales Engineer, Sales Manager in Rochester/Syracuse & Regional Sales Manager for the NE Territory.

Joe currently works part-time for Trane's East Territory & provides technical training through Becker Learning.

# ASHRAE's HVAC Design Training



## HVAC Design: Level I—Essentials

ASHRAE's *HVAC Design: Level I — Essentials* provides intensive, practical training for HVAC designers and others involved in the delivery of HVAC services. In three days, gain practical skills and knowledge in designing, installing and maintaining HVAC systems that can be put to immediate use. **This training is aimed at:**

- Graduates new to consulting practices and engineering teams
- Facility engineers with assigned HVAC responsibilities
- Experienced engineers who would benefit from a review of the basics and the new technology options to save energy
- Engineers, technicians and building operating personnel in career transition

### See Why Your Peers Recommend This Training:

*"Although my background is not in HVAC design or other environmental control systems, I certainly appreciate the value that this course has given me in terms of how it has expanded my ability to converse effectively with contractors. This basic knowledge should greatly improve my ability to act as an owner's rep in my project management work involving HVAC Design."*  
Evan B. — Dallas, TX

*"The most valuable HVAC course I have attended. I learned numerous nuggets that I will implement immediately. Valuable for engineers at all levels of experience."*  
Kevin T. — Saskatoon, Canada

*"This course was very valuable and will be applied completely to the scope of work that I do. The knowledge obtained through the very detailed and explained presentations will help a lot in design."*  
Jose G. — Houston, TX

**HVAC Design: Level 1—Essentials**

**When:** February 24–26, 2014

**Where:** Ted Weiss Federal Building  
New York, NY

**Cost:** \$1,239 (ASHRAE Member: \$989)



**BONUS!**

Get a FREE copy of *Standard 189.1-2011* and *User's Manual*.

---

**A \$200 Value!**



# ASHRAE's HVAC Design Training

Don't miss the first  
Training  
Session of  
2014

## HVAC Design: Level II—Applications

ASHRAE's *HVAC Design: Level II — Applications* provides advanced instruction on HVAC system designs for experienced HVAC designers and those who complete the HVAC Design: Level I — Essentials training. In two days, gain an in-depth look into *Standards 55, 62.1, 90.1, 189.1* and the *Advanced Energy Design Guides*. Training will focus on a range of topics including: HVAC equipment and systems, energy modeling, designing a chiller plant, and BAS controls. **This training is aimed at:**

- Engineers with HVAC design experience
- Architects who want an in-depth understanding of HVAC design
- Participants who attended HVAC Design: Level I-Essentials
- Construction project managers involved with mechanical systems

### See Why Your Peers Recommend This Training:

*"I wish this training was mandatory for everyone in the HVAC industry, especially design engineers! When applied, the instructors' accurate and concise suggestions make the whole HVAC design process clear and effective. Their examples prove that the design process can be simplified while still resulting in higher performing and healthier buildings."*

Tiffany B. — San Diego, CA

| "This course served as an effective means of combining lessons learned from the Level I course in real-life mock design scenarios."

| Justin B. —  
| San Francisco, CA

| *"I learned about new ASHRAE codes, standards and HVAC developments. I wish to recommend this training for all engineers involved in HVAC design."*

| Sunday S.—  
| Kaduna, Nigeria

## HVAC Design: Level II—Applications

**When:** February 27–28, 2014

**Where:** Ted Weiss Federal Building  
New York, NY

**Cost:** \$829 (ASHRAE Member: \$679)



## BONUS!

Get a FREE copy of *GreenGuide: The Design, Construction, and Operation of Sustainable Buildings, 4th. ed.*

A \$100 Value!

**REGISTRATION FORM**

# ASHRAE 2014 WINTER CONFERENCE

New York, NY January 18-22

**EARLY BIRD SPECIAL**

Register by November 3 and SAVE!  
Advance registration deadline December 31.  
Full registration opens January 1, 2014.

**MEMBER #** \_\_\_\_\_  
Member # must be supplied to receive member pricing.

**NON-MEMBER** (Registrants paying the non-member registration fee receive first year of membership free. Completed membership application form must be submitted by March 28, 2014).

Please send hotel information (provide email address).

If you have a disability which requires special assistance, please attach a description of your requirements with your registration form to enable us to make appropriate arrangements. Contact the hotel for wheelchair availability at the New York Hilton.

Last Name \_\_\_\_\_ First \_\_\_\_\_ Initial \_\_\_\_\_

Nickname (for badge) \_\_\_\_\_ Phone Number \_\_\_\_\_ FAX Number \_\_\_\_\_

Company Name (or name of school if student) \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ State/Province/Country \_\_\_\_\_ Zip/Postal Code \_\_\_\_\_

E-mail \_\_\_\_\_

**In which type of business or firm do you currently work? (check only one)**

- |  |  |   |
|--|--|---|
| <input type="checkbox"/> 01 HVAC&R Contractor/Contracting Firm                   | <input type="checkbox"/> 09 Manufacturer's Agent/Representative                                  | <input type="checkbox"/> 16 Other Allied to Field (specify) _____ |
| <input type="checkbox"/> 02 Plumbing Contractor/Contracting Firm                 | <input type="checkbox"/> 10 Importer/Exporter  | <input type="checkbox"/> 17 Guest/Spouse/Other _____              |
| <input type="checkbox"/> 03 Mechanical Contractor/Contracting Firm               | <input type="checkbox"/> 11 Manufacturer of HVAC&R & other Allied Equipment and Components (OEM) | <b>Business Focus</b>   |
| <input type="checkbox"/> 04 Other Primary Contractor/Contracting Firm            | <input type="checkbox"/> 12 Building/Facility/Plant Management or Operations                     | <input type="checkbox"/> 1 Residential                            |
| <input type="checkbox"/> 05 Consulting Engineering Firm or Individual Consultant | <input type="checkbox"/> 13 Public Utility or Government Agency                                  | <input type="checkbox"/> 2 Commercial                             |
| <input type="checkbox"/> 06 Architectural & Architectural/Engineering Firm       | <input type="checkbox"/> 14 Publishing   | <input type="checkbox"/> 3 Industrial                             |
| <input type="checkbox"/> 07 Design/Build Firms                                   | <input type="checkbox"/> 15 Education  | <input type="checkbox"/> 4 Institutional                          |
| <input type="checkbox"/> 08 Wholesaling/Distribution                             |  | <input type="checkbox"/> 5 Guest/spouse/other                     |

**Which of the following best describes your job function? (check only one)**

- |  |   |
|--|---|
| <input type="checkbox"/> 1 Owner, President, Partner                       | <input type="checkbox"/> 8 Sales/Marketing                        |
| <input type="checkbox"/> 2 Other Senior Management (VP, General Mgr, etc.) | <input type="checkbox"/> 9 Research/Product Design & Development  |
| <input type="checkbox"/> 3 Engineer  | <input type="checkbox"/> 10 Consultant                            |
| <input type="checkbox"/> 4 Architect                                       | <input type="checkbox"/> 11 Faculty/Student                       |
| <input type="checkbox"/> 5 Technician                                      | <input type="checkbox"/> 12 Editor/Publisher                      |
| <input type="checkbox"/> 6 Operations/Maintenance                          | <input type="checkbox"/> 13 Other Allied to Field (specify) _____ |
| <input type="checkbox"/> 7 Purchasing                                      | <input type="checkbox"/> 14 Guest/Spouse/Other _____              |

**CONFERENCE REGISTRATION** includes technical program and AHR Expo. \*\*includes virtual.

<b>Early Bird</b> ..... <b>Advance</b> ..... <b>Full Registration</b>			
Sept. 1-Nov. 3	Nov. 4-Dec. 31	Jan. 1-22	
<input type="checkbox"/> \$540	<input type="checkbox"/> \$565	<input type="checkbox"/> \$695	ASHRAE MEMBER**
<input type="checkbox"/> \$515	<input type="checkbox"/> \$540	<input type="checkbox"/> \$675	ASHRAE MEMBER-1ST TIME ATTENDEE**
<input type="checkbox"/> \$730	<input type="checkbox"/> \$755	<input type="checkbox"/> \$885	NON-MEMBER**
<input type="checkbox"/> \$705	<input type="checkbox"/> \$735	<input type="checkbox"/> \$860	NON-MEMBER-1ST TIME ATTENDEE**
<input type="checkbox"/> \$130	<input type="checkbox"/> \$130	<input type="checkbox"/> \$130	SPEAKER** (includes session chairs/forum moderators)
<input type="checkbox"/> \$155	<input type="checkbox"/> \$160	<input type="checkbox"/> \$165	LIFE MEMBER**
<input type="checkbox"/> \$55	<input type="checkbox"/> \$55	<input type="checkbox"/> \$55	ASHRAE STUDENT MEMBER
<input type="checkbox"/> \$55	<input type="checkbox"/> \$55	<input type="checkbox"/> \$55	ASHRAE STUDENT BRANCH ADVISOR
<input type="checkbox"/> \$80	<input type="checkbox"/> \$80	<input type="checkbox"/> \$80	FULL TIME STUDENT NON-MEMBER
<input type="checkbox"/> \$0	<input type="checkbox"/> \$0	<input type="checkbox"/> \$0	NEW YORK HOST COMMITTEE
<input type="checkbox"/> \$0	<input type="checkbox"/> \$0	<input type="checkbox"/> \$0	NEW YORK-MONITORS
<input type="checkbox"/> \$0	<input type="checkbox"/> \$0	<input type="checkbox"/> \$0	PRESS**
<input type="checkbox"/> \$55	<input type="checkbox"/> \$55	<input type="checkbox"/> \$55	SPOUSE
<input type="checkbox"/> \$249	<input type="checkbox"/> \$249	<input type="checkbox"/> \$249	ASHRAE MEMBER-VIRTUAL
<input type="checkbox"/> \$445	<input type="checkbox"/> \$445	<input type="checkbox"/> \$445	NON MEMBER-VIRTUAL

**SOCIAL EVENTS** All social events and tours will increase by approximately \$5 each Jan. 1.

QTY.	BY DEC. 31	TOTAL
20	@ \$75	_____
21	@ \$45	_____
22	@ \$55	_____
23	@ \$35	_____

**Saturday, January 18**  
20 Welcome Party, 6:30pm  
**Monday, January 20**  
21 President's Luncheon, 12:15pm  
**Tuesday, January 21**  
22 Members Night Out, 6:15pm  
23 Life Members Lunch, 12noon

**TOURS** (limited space per tour)

QTY.	BY DEC. 31	TOTAL
24	@ \$38	_____
25	@ \$35	_____
26	@ \$55	_____
27	@ \$30	_____
28	@ \$70	_____

**Sunday, January 19**  
24 NY TV & Movie Sites 1:00-4:00pm  
**Monday, January 20**  
25 Ground Zero, 2:15-6:00pm  
**Tuesday, January 21**  
26 Grand Central Terminal, 9am-12noon  
27 Financial District, 1:30-5:00pm  
28 Lincoln Center, 1:30-4:30pm

**TECHNICAL TOURS** (limited space per tour)

QTY.	BY DEC. 31	TOTAL
29	@ \$15	_____
30	@ \$25	_____
31	@ \$25	_____
32	@ \$15	_____
33	@ \$25	_____
34	@ \$25	_____
35	@ \$15	_____

**Sunday, January 19**  
29 NY Hilton, 3:30-4:30pm  
**Monday, January 20**  
30 Rockefeller Center, 3:30-5:00pm  
31 Penn Plaza, 2:15-5:00pm  
32 NY Hilton, 2:30-3:30pm  
**Tuesday, January 21**  
33 Penn Plaza, 12:15-3:00pm  
34 New School Univ. Ctr., 12:15-2:45pm  
35 NY Hilton, 3:00-4:00pm

**RESEARCH**

95 Research Promotion Contribution

**ASHRAE CONFERENCE PUBLICATIONS**

Code # _____	Quantity _____	@Price _____	Total _____
Code # _____	Quantity _____	@Price _____	Total _____

**GRAND TOTAL \$** \_\_\_\_\_ (Registration fees, social events, tours, publications)  
Payment must accompany registration form. ASHRAE reserves the right to charge the correct amount

**ASHRAE LEARNING INSTITUTE**

**Full Day**  \$395 ASHRAE Member  \$485 Non-member

- |  |   |
|--|---|
| <b>Saturday, January 18, 8am-3pm</b><br><input type="checkbox"/> 60 Commercial Bldg Energy Audits NEW<br><input type="checkbox"/> 61 Healthcare Facilities Design & Applications | <b>Wednesday, January 22, 9am-4pm</b><br><input type="checkbox"/> 77 Energy Mgmt in New & Existing Bldgs  |
| <b>Tuesday, January 21, 9am-4pm</b><br><input type="checkbox"/> 72 Energy Modeling Practice & Applications<br><input type="checkbox"/> 73 Changes to 90.1-2010 & IECC 2012 NEW   | <b>Thursday, January 23, 8am-3pm</b><br><input type="checkbox"/> 80 Complying with Std 90.1-2013 NEW<br><input type="checkbox"/> 81 OSN of High-Performance Bldgs<br><input type="checkbox"/> 82 Bldg Enclosure Commissioning NEW |

**Half-Day Courses**  \$119 ASHRAE Member  \$159 Non-member

- |   |  |
|---|--|
| <b>Saturday, January 18, 12pm-3pm</b><br><input type="checkbox"/> 62 Electric Rates, Rules & Regulations NEW  | <b>Monday, January 20, 2:45pm-5:45pm</b><br><input type="checkbox"/> 69 Commissioning High-Performance Bldgs<br><input type="checkbox"/> 70 High-Performance Healthcare Facilities NEW<br><input type="checkbox"/> 71 Scheduling Std 90.1-2013 to Meet LEED+ NEW |
| <b>Sunday, January 19, 2pm-5pm</b><br><input type="checkbox"/> 63 Air-Air Energy Recovery Applications<br><input type="checkbox"/> 64 Lab Design: Basics & Beyond<br><input type="checkbox"/> 65 Optimization to HVAC&R Systems & Components                              | <b>Tuesday, January 21, 1pm-4pm</b><br><input type="checkbox"/> 74 Fundamentals & Applications of Std 55 NEW<br><input type="checkbox"/> 75 Commercial GSHP NEW<br><input type="checkbox"/> 76 Data Center Energy Efficiency                                     |
| <b>Monday, January 20, 8:30am-11:30am</b><br><input type="checkbox"/> 66 CHF Efficiency Design & Operations<br><input type="checkbox"/> 67 High-Performance Bldg Design Applications & Trends<br><input type="checkbox"/> 68 AEC Design, Construction & Commissioning NEW | <b>Wednesday, January 22, 9am-12pm</b><br><input type="checkbox"/> 78 Application of Std 62.1-2013 NEW<br><b>Wednesday, January 22, 1pm-4pm</b><br><input type="checkbox"/> 79 Troubleshooting Humidity Control Problems   |

**METHOD OF PAYMENT:**  CHECK ENCLOSED—(Payable to ASHRAE/NYC14) U.S. FUNDS ONLY. CHARGE:  MasterCard  AMEX  Diners Club  VISA

CARD NO. \_\_\_\_\_ EXP. DATE \_\_\_\_\_ SIGNATURE \_\_\_\_\_

Send registration form and payment to: Meetings Section, ASHRAE, 1791 Tullie Circle, NE, Atlanta, GA 30329. Phone (404) 636-8400. FAX (678) 539-2219. Deadline: Dec. 31.  
Under proper safeguard ASHRAE will provide names of conference registrants to both sponsors of the ASHRAE conference and AHR exhibitors. If you do not wish to have your name and mailing address provided, please check the appropriate box.  No information from sponsors  No information from AHR exhibitors  
Your advance conference registration will be confirmed by email within 2 weeks of receipt. If you do not receive a confirmation, please contact the ASHRAE Conferences Section.



# ASHRAE Learning Institute

Seminars & Courses at ASHRAE's Winter Conference and AHR Expo in New York, NY

## 2 WAYS TO REGISTER

Internet: [www.ashrae.org/newyorkcourses](http://www.ashrae.org/newyorkcourses)

Phone: Call 1-800-527-4723 (US and Canada) or 404-636-8400 (worldwide)

### Full-Day Professional Development Seminars

\$485/\$395 ASHRAE Member -- Earn 6 PDHs/AIA LUs or .6 CEUs

**Commercial Building Energy Audits NEW!**  
Saturday, Jan 18 – 8:00 a.m. to 3:00 p.m.

**Healthcare Facilities: Best Practice Design & Applications**  
Saturday, Jan 18 – 8:00 a.m. to 3:00 p.m.

**Significant Changes to Standard 90.1-2010 and IECC-2012 NEW!**  
Tuesday, Jan 21 – 9:00 a.m. to 4:00 p.m.

**Energy Modeling Best Practices and Applications**  
Tuesday, Jan 21 – 9:00 a.m. to 4:00 p.m.

**Effective Energy Management in New and Existing Buildings**  
Wednesday, Jan 22 – 9:00 a.m. to 4:00 p.m.

**Operations and Maintenance of High-Performance Buildings**  
Thursday, Jan 23 – 8:00 a.m. to 3:00 p.m.

**Complying with Standard 90.1-2013 NEW!**  
Thursday, Jan 23 – 8:00 a.m. to 3:00 p.m.

**Introduction to Building Enclosure Commissioning NEW!**  
Thursday, Jan 23 – 8:00 a.m. to 3:00 p.m.

### Half-Day Short Courses

\$159/\$119 ASHRAE Member -- Earn 3 PDHs/AIA LUs or .3 CEUs

**Electric Rates, Rules and Regulations NEW!**  
Saturday, Jan 18 – 12:00 p.m. to 3:00 p.m.

**Laboratory Design: The Basics and Beyond**  
Sunday, Jan 19 – 2:00 p.m. to 5:00 p.m.

**Air-to-Air Energy Recovery Applications: Best Practices**  
Sunday, Jan 19 – 2:00 p.m. to 5:00 p.m.

**Mathematical Optimization Techniques and their Applications:  
to HVAC&R Systems and Components**  
Sunday, Jan 19 – 2:00 p.m. to 5:00 p.m.

**Combined Heat & Power: Design through Operations**  
Monday, Jan 20 – 8:30 a.m. to 11:30 a.m.

**High-Performance Building Design: Applications and Future Trends**  
Monday, Jan 20 – 8:30 a.m. to 11:30 a.m.

**IAQ Best Practices for Design, Construction and Commissioning NEW!**  
Monday, Jan 20 – 8:30 a.m. to 11:30 a.m.

**Commissioning for High-Performance Buildings**  
Monday, Jan 20 – 2:45 p.m. to 5:45 p.m.

**Designing High-Performance Healthcare Facilities NEW!**  
Monday, Jan 20 – 2:45 p.m. to 5:45 p.m.

**Exceeding Standard 90.1-2013 to Meet LEED® Requirements NEW!**  
Monday, Jan 20 – 2:45 p.m. to 5:45 p.m.

**Data Center Energy Efficiency**  
Tuesday, Jan 21 – 1:00 p.m. to 4:00 p.m.

**Fundamentals and Applications of Standard 55 NEW!**  
Tuesday, Jan 21 – 1:00 p.m. to 4:00 p.m.

**Design of Commercial Ground Source Heat Pumps NEW!**  
Tuesday, Jan 21 – 1:00 p.m. to 4:00 p.m.

**Applications of Standard 62.1-2013: Multiple Spaces  
Equations and Spreadsheets NEW!**  
Wednesday, Jan 22 – 9:00 a.m. to 12:00 p.m.

**Troubleshooting Humidity Control Problems**  
Wednesday, Jan 22 – 1:00 p.m. to 4:00 p.m.

## HVAC Design Training

March 17 – 19, 2014 --- Level I - Essentials --- Atlanta, GA and Toronto, Canada

March 20 – 21, 2014 --- Level II - Applications --- Atlanta, GA

**HVAC Design: Level I – Essentials** - Registration is \$1,239, \$989 (ASHRAE Member)

Gain practical skills and knowledge in designing, installing and maintaining HVAC systems that can be put to immediate use. The training provides real-world examples of HVAC systems, including calculations of heating and cooling loads, ventilation and diffuser selection using the newly renovated ASHRAE Headquarters building as a living lab.

**HVAC Design: Level II – Applications** - Registration is \$829, \$679 (ASHRAE Member)

In two days, gain an in-depth look into *Standards 55, 62.1, 90.1, and 189.1* and the *Advanced Energy Design Guides*. Training will focus on a range of topics including: HVAC equipment and systems; energy modeling; designing mechanical spaces; designing a chiller plant; and BAS controls.

Visit [www.ashrae.org/hvacdesign](http://www.ashrae.org/hvacdesign) to register

# ASHRAE Certification Programs

Receive the recognition you deserve by earning an ASHRAE Certification at the 2014 ASHRAE Winter Conference and AHR Expo.

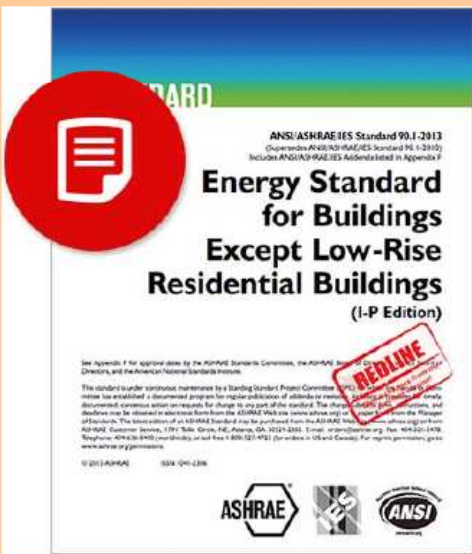
Take advantage of ASHRAE's special administration of the certification examinations on January 23, 2014. All exams will begin at 9:00 a.m. (candidates must report to the testing room at 8:30 a.m.). These exams are being offered in conjunction with the 2014 ASHRAE Winter Conference and AHR Expo in New York City. Refresh your knowledge in preparation of earning an ASHRAE certification with learning opportunities at the show and conference.

For more information, visit [www.ashrae.org/NYCExams](http://www.ashrae.org/NYCExams)



## Hot Products from ASHRAE

Latest Edition of Standard 90.1 Now Available as a Redline



Priced from \$135 (Members Pay \$115)  
Available now in I-P or SI units

Use the redline to instantly identify updates in the 2013 revision of Standard 90.1.

This expanded document compares the 2013 edition to 2010, ensuring you know exactly what changes have been made from one edition to the next.

It's an indispensable reference for engineers and other professionals involved in the design of buildings and building systems. Select the redline upgrade in print or digital format to receive two documents; the clean, active version of the standard and the redline version.

About Standard 90.1-2013: *Energy Standard for Buildings Except Low-Rise Residential Buildings (ANSI approved; IES co-sponsored)*

provides the minimum requirements for energy-efficient design of most buildings. Learn more

**About Redlines:** A redline document is a quick, easy way to compare all the changes between the active standard and the previous version. Redlines allow users to instantly identify additions, deletions, and other formatting and content changes. Learn more

Visit [www.ashrae.org/bookstore](http://www.ashrae.org/bookstore) to learn more about this and other outstanding ASHRAE publications!





Earn an ASHRAE certification while attending ASHRAE's Winter Conference and AHR Expo

ASHRAE has certified more than 1,600 HVAC professionals.  
Are you eligible to join this elite group?

The 2014 ASHRAE Winter Conference and AHR Expo in New York City will bring together more than 30,000 visitors from around the world. All six of ASHRAE's certification exams will be administered at the conference and show on **January 23, 2014**.

- [Building Energy Assessment Professional \(BEAP\)](#)
- [Building Energy Modeling Professional \(BEMP\)](#)
- [Commissioning Process Management Professional \(CPMP\)](#)
- [Healthcare Facility Design Professional \(HFDP\)](#)
- [High-Performance Building Design Professional \(HBDP\)](#)
- [Operations & Performance Management Professional \(OPMP\)](#)

To participate in this exam administration, applications must be submitted by **January 3, 2014** for the program in which you're interested. There will be no on-site registration and seating is limited. For eligibility requirements and applications, go to [www.ashrae.org/NYCExams](http://www.ashrae.org/NYCExams).

An ASHRAE certification is a distinct honor held by top professionals in HVAC&R and allied fields and is recognized as a standard of excellence worldwide. Take advantage of the opportunity to earn an ASHRAE certification while you're attending ASHRAE's Winter Conference and AHR Expo.

There are several opportunities available to help focus study efforts leading up to the exams:

- [Fall online courses](#)
- [E-learning courses](#)
- [CPMP Practice Exam](#)



# News

---

1791 Tullie Cir. NE | Atlanta, Ga. 30329-2305 | 404-636-8400 | [www.ashrae.org](http://www.ashrae.org)

For Release:  
Dec. 5, 2013

Contact: Jodi Scott  
Public Relations  
678-539-1140  
[jscott@ashrae.org](mailto:jscott@ashrae.org)

## **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](http://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](http://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](http://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)
- Operations & Performance Management Professional (OPMP)



# News

---

1791 Tullie Cir. NE | Atlanta, Ga. 30329-2305 | 404-636-8400 | [www.ashrae.org](http://www.ashrae.org)

For Release:  
Dec. 11, 2013

Contact: Jodi Scott  
Public Relations  
678-539-1140  
[jscott@ashrae.org](mailto:jscott@ashrae.org)

## ASHRAE Publishes 2013 Version of Thermal Comfort Standard

ATLANTA – Major revisions for design and measurement of comfortable spaces are included in a newly published 2013 standard from ASHRAE.

ANSI/ASHRAE Standard 55-2013, *Thermal Environmental Conditions for Human Occupancy*, combines the 2010 standard and 18 published addenda into a consolidated standard. The core of the standard in Sections 4 and 5 specifies methods to determine thermal environmental conditions (temperature, humidity, air speed and radiant effects) in buildings and other spaces that a significant proportion of the occupants will find acceptable at a certain metabolic rate and clothing level.

Section 7 of the standard includes new requirements for the measurement and evaluation of existing thermal environments and is also applicable to commissioning.

The standard has been re-written with a renewed focus on application by practitioners and use of clear, enforceable language. Requirements are now clearly stated and calculation procedures appear sequentially.

Other noteworthy additions to the standard include an allowance for the cooling effect of air movement as a way to extend the upper limit of the comfort zone in naturally conditioned spaces and addition of a predictive model for occupant clothing behavior based on extensive field research. These additions provide new methods for improving occupant comfort while minimizing energy use, according to Gwelen Paliaga, chair of the committee that wrote the standard.

Documentation requirements to show that a design meets Standard 55 are contained in Section 6 and a sample compliance form is provided in appendix J. Both of these sections are clarified and streamlined for use by owners and third party rating systems.

The 18 addenda published since 2010 are summarized in detail in Informative Appendix M, and the most noteworthy changes are summarized here:

- The normative body of the standard, comprising Sections 3 through 8, have been rewritten and reorganized.
- Requirements are more clearly stated, definitions are added to Section 3, and informative supporting information has been moved from the body to informative appendices.
- Procedures are clarified and appear in a more sequential manner. For example, a "representative occupant" with representative "clothing insulation" and "metabolic rate" shall be defined as input into thermal comfort calculations.
- The cooling effect of air movement now applies to naturally conditioned spaces as well as mechanically conditioned spaces, and in each case correction factors are given that adjust the comfort boundaries when air movement is present.
- A new alternate procedure for estimating occupant clothing insulation based on outdoor weather was added. This procedure is based on extensive field research and can be used for design calculations, annual simulations and control of occupied spaces.
- Major revisions to Section 7 procedures for measuring comfort in existing spaces including survey and physical measurement methods and a new section on evaluating and reporting results.
- The standard now requires that two of the key comfort parameters, air speed and air temperature, must be calculated as an average that the occupant experiences at three heights across the body and over a period of time.

The cost of ANSI/ASHRAE Standard 55-2013, *Thermal Environmental Conditions for Human Occupancy*, is \$95 (\$81, 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](http://www.ashrae.org/bookstore).

---





# News

---

1791 Tullie Cir. NE | Atlanta, Ga. 30329-2305 | 404-636-8400 | [www.ashrae.org](http://www.ashrae.org)

For Release:  
Dec.10, 2013

Contact: Jodi Scott  
Public Relations  
678-539-1140  
[jscott@ashrae.org](mailto:jscott@ashrae.org)

## ***2014 Winter Conference***

### **Low Energy vs. Good Indoor Environment Quality: Working To Achieve Both in Homes**

ATLANTA – In one corner, we have good indoor environment quality. In the other corner, we have energy efficiency. Do designers have to battle it out between the two or can they coexist peacefully?

Striking a balance between good indoor environmental quality and energy efficiency in homes is being addressed in a seminar at ASHRAE's 2014 Winter Conference.

"Great progress has been made in reducing residential energy consumption, with the latest buzzword being net zero," seminar chair Andrew Persily, Ph.D., National Institute of Standards and Technology, Gaithersburg, Md., said. "Whether a home is net zero or very low energy, it is critically important that energy efficiency measures do not compromise the indoor environment. Homes, and buildings in general, exist for the occupants, not to win energy efficiency competitions, but the industry often sees tension between the goals of energy efficiency and indoor air quality. As we move toward low-energy homes, we need to remember and address IAQ, providing low-energy homes that support and ideally improve the health and comfort of the occupants."

ASHRAE's 2014 Winter Conference, takes place 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](http://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](http://www.ashrae.org/newyork).

The seminar, IAQ in Low-Energy Homes: Avoiding Collateral Damage, is being held on Sunday, Jan. 19. It is part of a track focused on Indoor Environmental Health/Indoor Environmental Quality.

Speakers will share case studies and research that show how low energy and good IEQ can work in tandem.

Presentations and speakers include:

- Brennan Less, Residential Building Systems Group, Lawrence Berkeley National Laboratory, Berkeley, Calif., Field Study of Airtightness, Ventilation and IAQ in 24 High Performance Green California Homes
- Brett Singer, Ph.D., Lawrence Berkeley National Laboratory, Berkeley, Calif., Volatile Organic Compounds (VOC) and Formaldehyde (HCHO) Measurements in New Homes
- Kurt Roth, Ph.D., Fraunhofer Center for Sustainable Energy Systems, Cambridge, Mass., The Realities of Operation and Occupancy in Net Zero Energy Homes: Two Case Studies
- Persily, Ph.D., IAQ Specs in a Net-Zero Energy Research Home: How Well Did They Work

Other sessions in the Indoor Environmental Health/Indoor Environmental Quality track include:

- Chemical Laboratories Classification to Improve Safety and Energy Efficiency, Sunday, Jan. 19
- Selected papers in the Conference Paper Session 2, Sunday, Jan. 19
- Can Low Energy Buildings be Healthy for Occupants?, Sunday, Jan. 19
- Indoor Air Quality: Impact of Variables, Monday, Jan. 20
- The Human Factor - Better Understanding of Comfort, Environment, and Risks, Monday, Jan. 20
- Designs for Thermal Comfort and Energy Savings: Real Practices in School and Office Buildings, Monday, Jan. 20
- A Comprehensive Look at Infectious Disease and Air Filtration in Healthcare Facilities: Energy Saving, IAQ Performance, and What Makes You Sick, Tuesday, Jan. 21
- Real Co\$t of Filtration, Tuesday, Jan. 21
- Impact of Unvented Combustion on Indoor Air Quality, Wednesday, Jan. 22
- Lessons Learned from Storm Recovery, Wednesday, Jan. 22



# News

---

1791 Tullie Cir. NE | Atlanta, Ga. 30329-2305 | 404-636-8400 | [www.ashrae.org](http://www.ashrae.org)

For Release:  
Dec. 12, 2013

Contact: Amanda Dean  
Public Relations  
678-539-1216  
[adean@ashrae.org](mailto:adean@ashrae.org)

## Registration Open for ASHRAE's Hot Climate Conference in Qatar

ATLANTA— Registration is now open for the first International Conference on Energy and Indoor Environment for Hot Climates, which examines the latest research and energy efficiency technology in high ambient temperature climates.

Organized by ASHRAE, the ASHRAE Qatar Oryx Chapter and the Qatar Environment and Energy Research Institute (QEERI), the Conference takes place Feb. 24-26, 2014, in Doha, Qatar. It is endorsed by the United Nations Environment Programme (UNEP), the Chartered Institution of Building Services Engineers (CIBSE), the Federation of European Heating and Air-Conditioning Associations (REHVA), the International Association of Plumbing and Mechanical Officials (IAPMO), and co-sponsored by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI).

"The international support demonstrates the need for advancing the energy efficient design of buildings and systems in hot climates," Walid Chakroun, conference chair, said. "The conference brings together experts to look at the synergy between energy conservation and indoor air quality in buildings, with the goal of achieving high energy conservation in hot air climates. This first conference presents papers, keynote speeches and internationally-organized sessions and has an emphasis on systems and equipment and applications for commercial and institutional buildings."

The World Health Organization (WHO) will present a session on indoor environments and health, covering general perspectives on health and indoor environments; housing and health; health based guidelines on indoor air quality; and the health aspect of energy use in indoor environments.

UNEP and QEERI are hosting a special session with regional research centers to present updates on projects and research findings related to IAQ and energy efficiency, followed by a panel discussion.

A look at future HVAC&R technology presented by major companies is hosted by the Qatar Oryx Chapter and AHRI.

Some 40 papers will be presented, including "Evaluation of a Low Cost Solar Cooling System for Hot and Humid Climates;" "Building Envelope Criteria for Hot Climates: ASHRAE/IES Standard 90.1-2013;" "The Application of Low Energy Technology Within the Built Environment in Hot and Humid Climates;" and "Performance of Low-GWP Refrigerant Candidates At High Ambient Temperatures."

The conference proceedings will be distributed to conference attendees onsite and is included in the registration fee.

For the conference schedule and to register, visit [www.ashrae.org/hotclimates](http://www.ashrae.org/hotclimates).

---





# News

---

1791 Tullie Cir. NE | Atlanta, Ga. 30329-2305 | 404-636-8400 | [www.ashrae.org](http://www.ashrae.org)

For Release:  
Dec. 17, 2013

Contact: Jodi Scott  
Public Relations  
678-539-1140  
[jscott@ashrae.org](mailto:jscott@ashrae.org)

## **ASHRAE Seeks Presentations for Efficient, High Performance Buildings for Developing Economies Conference**

ATLANTA – Presentations are being sought for a conference focused on the design, construction and operation of buildings in developing economies.

Organized by ASHRAE along with the Philippines Chapter, the Efficient, High Performance Buildings for Developing Economies Conference will take place April 24-25, 2014, in Manila, Philippines. It is co-sponsored by the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) and endorsed by the International Association of Plumbing and Mechanical Officials (IAPMO).

Call for presenter proposals are due Jan. 31, 2014. A 400-word abstract addressing a specific topic and speaker background information are required. Presentations of case studies, preferably with actual performance data, are of most interest. Notifications will be issued in February 2014.

The conference addresses the challenges developing countries face in sustainable construction, such as rapidly growing energy demand, population density and urbanization, and focuses on aspects relating to design, construction and operation of high performance buildings, including the HVAC&R industry's role in meeting this objective.

The conference seeks to bring people from diverse cultures and climates together to share building design approaches that are responsive to local needs, said Ashish Rakheja, conference co-chair. A key motivation behind the conference is to utilize traditional construction practices.

"The papers and presentation will provide examples of how to apply the latest technology to achieve cost effective solutions to support high performance buildings in developing economies," he said.



# News

---

1791 Tullie Cir. NE | Atlanta, Ga. 30329-2305 | 404-636-8400 | [www.ashrae.org](http://www.ashrae.org)

For Release:  
Dec. 16, 2013

Contact: Jodi Scott  
Public Relations  
678-539-1140  
[jscott@ashrae.org](mailto:jscott@ashrae.org)

## ASHRAE Offers First Opportunity to Comment on Proposed Guideline for Commissioning Existing Systems, Assemblies

ATLANTA – With functional changes and occupant productivity driving the need to commission existing facilities, ASHRAE is developing a guideline that addresses the commissioning process. The guideline is now open for public input.

ASHRAE Guideline 0.2P, *The Commissioning Process for Existing Systems and Assemblies*, describes the procedures, methods, documentation, requirements and physical activities of the commissioning process for existing buildings, systems and assemblies using the principles developed in ASHRAE Guideline 0-2005, *The Commissioning Process*.

The proposed guideline is open for public comment from Dec. 6 until Jan. 20, 2014. For more information, visit [www.ashrae.org/publicreviews](http://www.ashrae.org/publicreviews).

"The most fundamental difference between new and existing building commissioning besides the obvious – one is new construction, one is existing – is that the function of the space may have changed substantially since it was designed," Bill Dean, chair of the committee writing Guideline 0.2, said. "Related to that is that the building occupants are people with a voice and opinion as opposed to the theoretical occupant in new construction represented by the architect or owner. A great deal of the focus in the past was on energy savings being used to fund building improvements; now we are seeing functional changes and occupant productivity driving the need to commission existing facilities."

Commissioning of existing systems also should result in energy and cost savings. Dean referenced a 2009 study from Lawrence Berkeley National Laboratory that suggests a median 16 percent energy savings with a 1.1 year payback for energy based existing building commissioning. The study noted "commissioning is arguably the most cost-effective strategy for reducing energy, costs and greenhouse-gas emissions in buildings today."

Commissioning also impacts occupant comfort and assists in repurposing buildings. The quantifiable non-energy benefits are often equal to or greater than energy savings.

Guideline 0.2P is a process guideline that is intended to be applied to any type of facility.

For example, we envision technical requirement guides being written to cover building envelope, elevators, fire alarm systems, smoke control, lighting electrical, plumbing, site infrastructure and district heating and cooling, etc." Dean said. "The same ASHRAE committee is currently developing the technical requirements for a proposed standard on existing HVAC&R systems (1.2P, *The Commissioning Process for Existing HVAC&R Systems*)."

Other commissioning guidance from ASHRAE includes Guideline 0-2005, *The Commissioning Process*; Guideline 1.1-2007, *HVAC&R Technical Requirements for the Commissioning Process*; and Guideline 1.5-2012, *The Commissioning Process for Smoke Control Systems*; and Standard 202-2013, *Commissioning Process for Buildings and Systems*.

ASHRAE also is working on several other guidelines related to commissioning: Guideline 1.2P, *The Commissioning Process for Existing HVAC&R Systems*; Guideline 1.3P, *Building Operation and Maintenance Training for the HVAC&R Commissioning Process*; and Guideline 1.4P, *Procedures for Preparing Facility Systems Manuals*.

---

Papers are sought on the following themes:

- Design criteria for developing countries
- Hot and humid climates
- Thermal comfort preferences and cultural expectations
- Impact of thermal design criteria on energy use and occupant well-being
- Indoor air quality
- Impacts of outdoor air quality issues
- Potential application of natural ventilation
- Energy efficiency
- Indoor environmental quality constraints on energy efficiency
- Reductions in emissions of global warming gases through use of renewable energy
- Energy impacts associated with water use
- Standards and government regulations
- Green building programs in developing countries
- Energy efficiency standards
- Indoor air quality and comfort regulations
- Refrigeration
- Refrigerants: limitations and opportunities
- Applications, e.g. improved food preservation
- Rural communities
- Water use
- Lack of energy infrastructure
- Combustion using low-grade fuels

In addition, presentations based on papers and invited speakers from around the world will focus on the most critical challenges facing developing economy countries.

---