ASHRAE Boston Chapter

# NorthEastAire

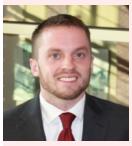
ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers

XXXXVIII No.6 | February 2016 | Editor: Deanna Adkison 617-535-8236

## 2015-2016 Officers

*Stacie Suh*
*President*

*William Tang*
*President-Elect*



*Mike Gilroy*
*Vice President*

*Dan Carington*
*Secretary*

*Bill Garvey*
*Treasurer*

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# February Meeting

**Tuesday, February 9, 2016**

## Main Meeting:

## Infrastructure Resiliency Design in Healthcare Post Superstorm Sandy

## Tech Session:

Power and Energy Metering

*Membership Promotion, Research Promotion & YEA Night*

Refer to Page 3 for more information

**Meeting Manager:**
Mark Leonard
MCL@brplusa.com

**Where:**
Metro Meeting Centers
101 Federal St.
Boston, MA

**Cocktail Sponsor:**
M.A. SELMON CO., INC

**Meal:**
Penne & Spaghetti
Meatballs ~Chicken Strips
Peppers & Onions
Marinara & Alfredo Sauce
Metro Café Caesar Salad
Hearts of Romaine Lettuce, Shredded Parmesan
Cheese & Multigrain Croutons
Garlic Bread
*Vegetarian meal TBD

**Time:**

| | |
|---|---|
| 5:15 - 6:00 | Technical Session (Room TBD) |
| 5:30 - 6:45 | Social/Registration/Dinner (in dining room & common area) |
| 6:45 - 8:00 | Dessert, Announcements & Main Program (in Lexington/ Concord Meeting Room) |

**Cost:**

| | |
|---|---|
| ASHRAE Boston Members: | $50 |
| Non –Members / Walk-Ins: | $60 |
| ASHRAE Student Members with RSVP: | Free |

**Parking:**
Garage At Post Office Square, Zero Post Office Square, Boston, MA ($9 after 4:00 pm)

## Special thanks to our Sponsors:

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- RST Thermal
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- Equipment Direct Sales, Inc.

**Please register online at www.ashraeboston.org. RSVP by 12:00 PM on Friday, February 5, 2016**
**If you have any questions, you may contact Erin Popa, Attendance Chair, at ashraebostonattedance@outlook.com.**
**Thank You**

# PRESIDENT'S MESSAGE

*By: Stacie Suh*

Hope everyone is enjoying this winter!

We are pleased to announce that our new website is up and running. Please check out www.ashraeboston.org. Kevin Doty has been working very hard to get the new website going.

We will hold our first social event on February 4th at Stoddards (Boston). Please join us at this event. It will give members a chance to meet officers, Board of governors and committee chairs. Please contact Deanna for more information. DAdkison@akfgroup.com

ASHRAE Boston Chapter had its January meeting at Embassy Suites in Waltham. We were very pleased let you know that meeting was a success even though we had a last minute change in the date of the meeting due to a situation with the speaker. It was history and president's night, we had six past presidents join us at the meeting and our BOG meeting, which is held prior to the main meeting.

We need your support to get your feedback in regards to the main meeting and technical session. Mike Gilroy, CTTC chair, sends out a survey via Survey Monkey to all attendees right after the meeting. **We appreciate your feedback!** Any questions, please contact Mike Gilroy at Mgilroy@brplusa.com

For members who couldn't make it to the meeting and want to know more about the January meeting, please refer to the meeting recap section written by Andrew Krenning for details.

I would like to first thank Steve Bistak (Novatorque) for a great presentation on *Permanent Magnet Motors for Higher Efficiency*. The presentation was open discussion format that got all members engaged throughout the presentation. Thank you Eric Edman for your brief presentation on history, he had the audience entertained. Thank you Christine Reinders for your presentation on the Technical committee. Please reach out to Christine at creinders@cannondesign.com if you are interested in being involved.

Secondly, I would like to thank technical session speaker Skip Creamer (Atlantic Air Products) for his great presentation on *Special Gas Venting Systems - Proper System Design for Category IV Appliances*

I would like to also thank all of the attendees at the January meeting. Special thanks to behind the scene crew, Mark Leonard, Erin Popa, Bill Garvey, Kevin Doty and Steve Bosland.

Next month's meeting will be held on February 9th (Tuesday) at 101 Federal St in Boston, MA. Please join us in welcoming main meeting speaker Steven Friedman (Director, Facilities Engineering at Memorial Sloan Kettering Cancer Center). The meeting is on *Infrastructure Resiliency Design in Healthcare – Post Superstorm Sandy.*

Hope to see you all at the February meeting! We have one more main meeting after the February meeting. I encourage all members to bring along non-members to this event. We need your support to keep Boston Chapter growing and to share the good news with our local community.

ASHRAE Boston chapter has made available corporate sponsorship opportunities. Please contact Will Tang at wtang@brplusa.com for more information. We look forward to your sponsorship, which will support the Boston chapter greatly. A huge "Thank you" goes out to Daikin, RDK Engineers, RenewAire, RG Vanderweil, Stebbins Duffy, Filter Sales & Service, Inc, R.T.Forbes Company, J.S. Fleming Associates and Victaulic who are already part of the sponsorship program and supporting the Boston Chapter.

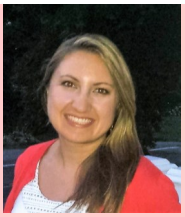
**ASHRAE Boston Chapter will be hosting a Product show in April 2016. Please sign up with Jeff Schultz. For more information go to www.ashraeboston.org.**

I look forward to meeting all of you throughout the year. I would love to hear from you with any thoughts you might have concerning the ASHRAE Boston Chapter. You can email me at stacie@stebbinsduffy.com

Thank you

Stacie Suh

ASHRAE Chapter President



# EDITOR'S NOTE

***By: Deanna Adkison***

Materials for the March newsletter are due by **February 12, 2016**.

Please submit employment/want ads in .pdf, .doc or .jpg format. A company logo may also be included. Feel free to send any ideas you would like to share or include in next month's issue.

For additional information, refer to our website at www.ashraeboston.org.

For more information, please e-mail northeastaire@gmail.com

**Tech Session:** Power and Energy Metering

**Description of Presentation:**

This will be a survey course in Electricity. Starting with defining Electricity, Terms and Fundamentals. We will then go into How Utilities Bill and how those factors relate to Commercial billing. We will then cover Commercial Electrical distribution systems including Polyphase, Single phase, and Split phase. Applications and reasons for Power Metering in Commercial and Campus systems.

**Speaker Bio:** *Brad Selmon*

Brad Selmon is a Graduate of University of Rochester. He represents Flexim Instruments , PDMA , Dent Instruments, Vortek Flow, Hoffer Flow, Monarch Instruments, Sage Gas Flowmetering.

He is Factory certified in : Motor Circuit Evaluation, Online Electric Motor Testing, Flow Measurement and Field Flow Calibration, Electric Motor Data Analysis, Ultrasonic Inspection Level 1.

He has been selling and servicing Process instruments for 22 years. Currently , he specialized in Campus Sub-metering. His Clients include: Harvard Facilities, Harvard Business School, MIT Chiller Plant, Brown University, Veolia Energy, Fairfield University, BNY – Mellon, Wesleyan, Trinity College, Acushnet – Titleist, Worcester Housing

## MAIN MEETING:

**Title of presentation:** Infrastructure Resiliency Design in Healthcare Post Superstorm Sandy

**Description of presentation:**

The presentation will focus on health care based MEP infrastructure resiliency design, post-super storm Sandy. Lessons learned and taking a hard look at how healthcare Facilities Management is implementing strategic based design to allow for continuous operation during adverse environmental conditions

**Speaker Bio:**

*Steven Friedman, PE, HFDP, LEED AP*

Director of Facilities Engineering Design + Construction

Memorial Sloan Kettering Cancer Center, New York, New York

Steven Friedman is Senior Management spearheading the Engineering Department for Facilities Design + Construction at Memorial Sloan Kettering Cancer Center. He brings more than 27 years of engineering and construction experience with a focus on implementing proper healthcare design standards to ensure patient safety and comfort. He has designed systems for numerous world-class institutions throughout the Northeast and is the first New York State engineer certified as a Healthcare Facility Design Professional, recognized by the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) for his mastery of the technical knowledge covering design and operation of healthcare facilities. Steven is a licensed professional engineer, a member of the United States Green Building Council (USGBC), American Society of Healthcare Engineers (ASHE) and the American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE). He has served on the Board of Governors for the Long Island Chapter of ASHRAE since 2000, finishing his active duty as President in 2008-2009. With a continuous dedication to engineering & healthcare, Steven is an active member of the ASHRAE Standard 170 committee (Ventilation in Healthcare Facilities), technical committee member of ASHRAE TC 9.6 Healthcare Facilities, member of the FGI Healthcare Guidelines Revision Committee and corresponding member of ASHRAE Standard 189.3 committee (Sustainable High Performance Healthcare Facilities)

# January Meeting Recap

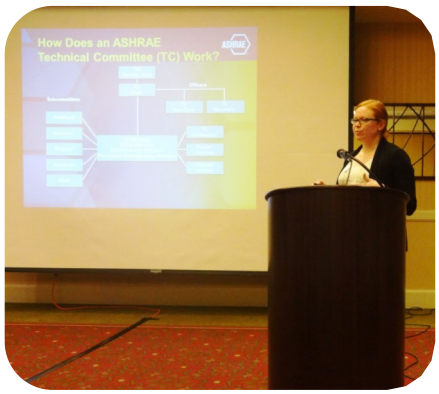
*By: Andrew Krenning*



The first chapter meeting of 2016 was kicked off by ASHRAE Boston President Stacie Suh who welcomed everyone to Past


President's and History night. She started with introducing all the Past Presidents that were in attendance at the meeting and thanking them for their service to ASHRAE and the Engineering Community. An update was given on the new ASHRAE Boston website and everyone was encouraged to visit the new site and spread the word.

Eric Edman was introduced and provided a great history lesson on the godfather of air conditioning, William Cullen and the progression of the industry all the way to Willis Carrier.




Christine Reinders, ASHRAE Boston YEA Chair, talked about the upcoming ASHRAE winter meetings in Orlando and how everyone can get involved. She presented a brief overview of what a technical committee is and provided information on why it's important to join and get involved.

The main meeting presentation was given by Steve Bistak who is currently a Sales Executive with Novatorque on the topic of electric motor efficiency and permanent magnet motors. He covered the different regulations that are in place for high efficiency motors and the current options that are available for overall better efficiency. He outlined the PMAC motor performance advantages specific to some of the real world savings that are displayed by these motors. He covered the different permanent motor types, and the requirement to have an individual VFD per motor and that no sine wave bypass is available with these motors. He mentioned that most VFD manufactues make VFD's that are used on PM motors, but to be careful in retrofit situations when trying to re-use existing VFD's.

Look forward to seeing everyone at the February meeting, which will be held at the Metro Meeting Center in Boston.

Don't forget to follow us on twitter @ASHRAEboston and on LinkedIn for all the latest news.

**FREE SUNDAY RIVER & SUGARLOAF DISCOUNT SKI VOUCHERS, SAVE $19 PER ADULT TICKET**

The Boston Chapter is participating in the Sunday River/Sugarloaf corporate voucher program again this year. Each voucher entitles you to purchase up to four discounted lift tickets [$70 Adults, $58 Teen, $48 Junior/Senior] at either ski resort by presenting an ASHRAE membership card, picture ID, and voucher. The regular prices are $89/$69/$59. Contact Ed Waldman, ewaldman1@verizon.net, if you would like any vouchers. The voucher is a PDF that can be e-mailed to you, but the resorts have become stricter about showing your ASHRAE card when you purchase the tickets. There is no charge for the vouchers and there are no blackout dates. Complete rules below:

**How To Use Vouchers**

1. Bring your corporate voucher to any participating resorts ticket window.
2. Present your voucher, photo ID, and valid ASHRAE membership card to the ticket seller. In the absence of the individual member, immediate family members defined as spouse and children, must present some form of ASHRAE identification, plus a photo ID in order to receive the discount.

Each person expecting the corporate pricing must be present with the corporate voucher holder at the time of ticket purchase. The ticket seller will take the voucher in exchange for up to 4 lift tickets.

**Presidential Award of Excellence**

**Boston Chapter - 2015-2016**

| Chapter Members | Membership Promotion Points | Student Activities Points | Research Promotion Points | History Points | Chapter Organization Points | Chapter Technology Transfer Points | Grassroots Government Affairs Points | Chapter PAOE Point Totals |
|---|---|---|---|---|---|---|---|---|
| 1040 | 610 | 560 | 420 | 50 | 865 | 950 | 75 | 3530 |

## Employment Ads

### ASHRAE Boston Chapter – Employment Ads

The NorthEastAire is published monthly, September through June. It is posted on the Chapter website at www.ashraeboston.org. A link is sent each month to all members of the Chapter, currently over 1000.

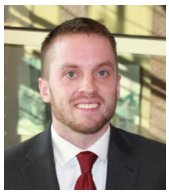
**Newsletter Rate:** $200 for 1/4 page, $400 for 1/2 page, $800 for full page

**Website Rate:** $300 per calendar month

**Format**: Word format, company logos in .jpg or .gif

**Deadline for March Newsletter: February 12, 2016**

Any questions, please contact Deanna Adkison, Newsletter Editor at 617-535-8236 or northeastaire@gmail.com



*By: Mike Gilroy*

## Harnessing the Energy of Small Bending Motions

*David L. Chandler | MIT News Office*
*January 6, 2016*

For many applications such as biomedical, mechanical, or environmental monitoring devices, harnessing the energy of small motions could provide a small but virtually unlimited power supply. While a number of approaches have been attempted, researchers at MIT have now developed a completely new method based on electrochemical principles, which could be capable of harvesting energy from a broader range of natural motions and activities, including walking.

The new system, based on the slight bending of a sandwich of metal and polymer sheets, is described in the journal *Nature Communications,* in a paper by MIT professor Ju Li, graduate students Sangtae Kim and Soon Ju Choi, and four others.

Most previously designed devices for harnessing small motions have been based on the triboelectric effect (essentially friction, like rubbing a balloon against a wool sweater) or piezoelectrics (crystals that produce a small voltage when bent or compressed). These work well for high -frequency sources of motion such as those produced by the vibrations of machinery. But for typical human-scale motions such as walking or exercising, such systems have limits.

"When you put in an impulse" to such traditional materials, "they respond very well, in microseconds. But this doesn't match the timescale of most human activities," says Li, who is the Battelle Energy Alliance Professor in Nuclear Science and Engineering and professor of materials science and engineering. "Also, these devices have high electrical impedance and bending rigidity and can be quite expensive," he says.

### Simple and flexible

By contrast, the new system uses technology similar to that in lithium ion batteries, so it could likely be produced inexpensively at large scale, Li says. In addition, these devices would be inherently flexible, making them more compatible with wearable technology and less likely to break under mechanical stress.

While piezoelectric materials are based on a purely physical process, the new system is electrochemical, like a battery or a fuel cell. It uses two thin sheets of lithium alloys as electrodes, separated by a layer of porous polymer soaked with liquid electrolyte that is efficient at transporting lithium ions between the metal plates. But unlike a rechargeable battery, which takes in electricity, stores it, and then releases it, this system takes in mechanical energy and puts out electricity.

When bent even a slight amount, the layered composite produces a pressure difference that squeezes lithium ions through the polymer (like the reverse osmosis process used in water desalination). It also produces a counteracting voltage and an electrical current in the external circuit between the two electrodes, which can be then used directly to power other devices.

Because it requires only a small amount of bending to produce a voltage, such a device could simply have a tiny weight attached to one end to cause the metal to bend as a result of ordinary movements, when strapped to an arm or leg during everyday activities. Unlike batteries and solar cells, the output from the new system comes in the form of alternating current (AC), with the flow moving first in one direction and then the other as the material bends first one way and then back.

This device converts mechanical to electrical energy; therefore, "it is not limited by the second law of thermodynamics," Li says, which sets an upper limit on the theoretically possible efficiency. "So in principle, [the efficiency] could be 100 percent," he says. In this first-generation device developed to demonstrate the electrochemomechanical working principle, he says, "the best we can hope for is about 15 percent" efficiency. But the system could easily be manufactured in any desired size and is amenable to industrial manufacturing process.

### Test of time

The test devices maintain their properties through many cycles of bending and unbending, Li reports, with little reduction in performance after 1,500 cycles. "It's a very stable system," he says.

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Previously, the phenomenon underlying the new device "was considered a parasitic effect in the battery community," according to Li, and voltage put into the battery could sometimes induce bending. "We do just the opposite," Li says, putting in the stress and getting a voltage as output.

Besides being a potential energy source, he says, this could also be a complementary diagnostic tool in electrochemistry. "It's a good way to evaluate damage mechanisms in batteries, a way to understand battery materials better," he says.

In addition to harnessing daily motion to power wearable devices, the new system might also be useful as an actuator with biomedical applications, or used for embedded stress sensors in settings such as roads, bridges, keyboards, or other structures, the researchers suggest.

"This work is very interesting and significant in the sense that it provides a novel approach to converting mechanical energy through an electrochemical route, using a simple design and device structure," says Wu Wenzhuo, an assistant professor of industrial engineering at Purdue University who was not involved in this work. "More significantly, the output current from the demonstrated device is very large, with a long pulse duration. This is very important for practical applications, since most other mechanical energy harvesting methods suffer from the issues of small current output with short pulse duration."

Wenzhuo adds that "efficient harvesting of such mechanical energies will help to develop more capable and intelligent wearable devices and human-machine interfaces. This work presents huge potential in many applications such as flexible electronics, self-powered sensors, wearable devices, human-machine interfaces, robotics, artificial skin, etc."

The team also included postdoc Kejie Zhao (now assistant professor at Purdue University) and visiting graduate student Giorgia Gobbi , and Hui Yang and Sulin Zhang at Penn State. The work was supported by the National Science Foundation, the MIT MADMEC Contest, the Samsung Scholarship Foundation, and the Kwanjeong Educational Foundation.

## STUDENT ACTIVITIES

*By: Dan Diorio*

This ASHRAE season is flying by. There are only 2 more official monthly meetings. Then, in April, we'll have the New Product and Energy Show at The Lantana in Randolph.

Speaking of the show, it's time to remind you again and make a shout-out for volunteers…

Firstly, we invite the student branches to display projects at tables near the registration desk. Also, there is also a lot of work to do on the day of the event. We would appreciate any help that you can provide – not to mention, facilitate exposure to the many potential future employers that come through the door!

Construction of the brand new residence hall at Boston College is nearing completion. It will be opening for the Fall 2016 semester at 2150 Commonwealth Avenue. The building has state-of-the-art mechanical systems that are worth seeing. I'll be sending invitations to student chapter advisors to tour the building in the coming months. Typically these tours can be flexible to the student schedules. Be on the lookout for an email invitation or feel free to call me at your convenience to schedule something right away!

The SA Committee is always looking for ways to expand and for volunteer help. If there are ASHRAE members looking to help out with the committee, participate-in or suggest ideas for student activities, please contact me at any time via email at dan.diorio@bc.edu or stop by and say hello at one of the monthly meetings. And please let me know if you or anyone you know may be a candidate to take over as Committee Chair for the next ASHRAE Boston season.

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Fax completed ticket to: ***(770) 447-4354*** or mail to: ***GLOBALCON 2016 Registrar, AEE, 3168 Mercer University Drive, Atlanta, GA 30341*** or email to: ***Connie@aeecenter.org***

**OPTION 1: *Online.*** To register online and print out additional expo tickets, visit the GLOBALCON show website at www.globalconevent.com/FreeExpoPass

**OPTION 2: *Preregister by Fax, Mail, or Email.*** Your completed preregistration card must be received no later than February 26, 2016. After this date, register onsite at Hynes Convention Center. Your show badge will be mailed to you at the address you provide below.

Fax completed ticket to: ***(770) 447-4354*** or mail to: **GLOBALCON 2016 Registrar, AEE, 3168 Mercer University Drive, Atlanta, GA 30341** or email to: **Connie@aeecenter.org**

**OPTION 3: *Onsite.*** After **February 26, 2016**, complete this card and bring it with you to the onsite Expo "Visitor" registration desk located at Hynes Convention Center. Your show badge will be prepared for you for free show admission *($95 value)*.

NAME _____ (LAST / FIRST / MI)
TITLE _____
FIRM _____
ADDRESS _____
CITY _____
STATE _____ ZIP _____
PHONE _____ FAX _____
EMAIL _____

*No one under 16 years of age admitted.*

**PLEASE COMPLETE AS PART OF REGISTRATION**

**1. Type of Firm/Business** *(check only one)*:

| | | |
|---|---|---|
| ☐ Commercial | ☐ Government | ☐ Utility/Energy Producer |
| ☐ Industrial | ☐ Consulting Engineer | ☐ Manufacturer/Vendor |
| ☐ Institutional | ☐ Construction/Architect | ☐ Press/Trade Media |

**2. Occupation/Title** *(check only one)*:

| | | |
|---|---|---|
| ☐ Manager | ☐ Plant Engineer/Facility Manager | ☐ Educator/Researcher |
| ☐ Owner/Developer | ☐ Energy Engineer/ Energy Manager | ☐ Architect |
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## Webmaster's Notes

*By: Steve Rosen*

Your Boston Chapter Webmaster welcomes your suggestions as we begin interacting with the NEW ASHRAE Boston homepage!

The Boston Chapter thanks Kevin Doty for diligently working with Wild Apricot to establish our NEW website!

# RESEARCH PROMOTION

*By: Dan Diorio*

Thanks again to our most recent contributors to this year's Research Promotion fundraising campaign! Monthly donations have been steady and I really appreciate that.

If you're interested in making a contribution toward ASHRAE Research, I encourage you to spend some time on the RP website at www.ashrae.org/research. You will find extensive information regarding the Research program including the Strategic Plan for Research. The plan itself, as well as all of the supporting documents, can be found on this website.

Of perhaps even more interest on the website are specific details about the ongoing research projects. There are instructions for submitting a potential project, project results, and lists of projects ready to go to bid for research.

Donations to ASHRAE RP can be made in several ways. You can donate online at ashraeboston.org or ashrae.org/contribute. Your company can become a Corporate Sponsor - where a portion of your sponsorship goes toward Research. You can also do it by mailing a check directly to me at:

Dan Diorio

Boston College – St. Clements Hall

140 Commonwealth Ave

Chestnut Hill, MA 02467

Feel free to contact me with any questions about ASHRAE Research, my fundraising campaign, or donations in general at dan.diorio@bc.edu.

# Come kick off the new year and fight the winter blues with ASHRAE Boston's first networking event!

## *Stoddard's*

48 Temple Pl, Boston, MA 02111


### Thursday, February 4th 2016

5:30 pm: Meet Officers, Board of Governors and Committee chairs

6:30 pm: All members for social event

Join us in the downstairs bar at Stoddard's for some food and drinks to meet other ASHRAE members in the Boston area. This will be a great opportunity to see what is going on behind the scenes in the ASHRAE Boston chapter for those who are looking to become more involved.

We hope to see you there!

ASHRAE Boston Chapter

# ASHRAE Government Affairs Update

*By: Steve Rosen*

***ASHRAE Government Affairs Update, 1/18/2016***

**As of July 1 2015 GGAC changed from Grassroots Government Activities Committee to Grassroots Government Advocacy Committee.**

## Federal Activities

The Energy Policy Modernization Act (EPMA) of 2015 (S.2012) is the comprehensive bipartisan bill that is supported by most members of the Senate Energy & Natural Resources Committee – including the Committee's top Republican and Democrat. Additionally, because the many parts of EMPA have been working their way through Congress for the past several years, the attitudes of Members of Congress towards the bill are generally well-known. Despite all of this, the bills' fate remains unclear – for the moment.

According to Senate staff, given the anticipated congressional calendar and likely need to address other unforeseen events, the best time for EPMA to be debated and possibly passed is between January and early February. This is a unique window in which Members of Congress are in Washington, DC for an extended period of time with nothing definitely scheduled yet for the Senate floor. The schedule will solidify over the next two weeks.

If EPMA is debated on the Senate floor, it will likely occur under an open amendment process, which could either allow Members of Congress to voice their concerns and add favored provisions to it or grind consideration of the bill to a halt. While surprises do occur, if EPMA is derailed in January-February, it's unlikely to be taken up again until 2017.

2015 was the Earth's warmest year since records began in 1880, the National Oceanic and Atmospheric Administration (NOAA) announced on Jan. 20. In 2015, the average temperature across the Earth's land and ocean surfaces was 1.62°F (0.9°C) above average, the largest margin by which an annual global temperature record has been broken, NOAA said. Record warmth was broadly spread around the world, NOAA reported, with portions of central and South America, Europe, and central Asia seeing some of the warmest temperatures. A separate analysis of data from NASA agreed with NOAA's findings. According to NASA 15 of the 16 warmest years have occurred since 2001.

## GGAC Regional and Chapter Activities

Two States with off-year elections chose new Governors in November of 2015, succeeding term-limited Governors who were not eligible for re-election. In Kentucky, Matt Bevin (R) succeeded outgoing Governor Steve Beshear (D) and, in Louisiana, John Bel Edwards (D) will take office on January 11, succeeding retiring Governor Bobby Jindal (R).

In addition to these two new Governors, legislatures in California, Indiana, Kentucky, Maine, Mississippi, Missouri, Nebraska, New Hampshire, New York, Rhode Island and Vermont all began their 2016 sessions during the first week of January. Along with budget and appropriations for State operations, lawmakers in these States will consider a wide array of bills from education, gun control, sentencing reform, and infrastructure improvement. Watch for a large number of bills to be introduced in the next few weeks.

To give a comparison between the United States Congress and the State legislatures, the 113th Congress (2013-14) passed 352 bills. In contrast the States passed 45,564 and introduced 180,808. The 114th Congress is on track to pass even less than in the previous session but, by December 2015, the States had passed 30,000 bills and most are only halfway through their biennial legislative sessions.

Researchers at MIT have developed a new method to harness the energy of small motions to provide a small but virtually unlimited power supply. The method is based on electrochemical principles, which could be capable of harvesting energy from a range of motions and activities, including walking. It uses technology similar to that in lithium ion batteries, so it could be produced inexpensively at large scale. Also, the devices would be inherently flexible, making them more compatible with wearable technology and less likely to break under mechanical stress. When bent even a slight amount, the layered composite produces a pressure difference that squeezes lithium ions through the polymer (similar to the reverse osmosis process used in water desalination). It also produces a counteracting voltage and an electrical current in the external circuit between the two electrodes, which can be then used directly to power other devices.

**Your Boston GGAC committee welcomes your articles and event suggestions!**

**Please contact Christine Reinders, Stacie Suh or Steve Rosen.**

stacie@stebbinsduffy.com

creinders@CANNONDESIGN.COM

steven_rosen@AHA-engineers.com

# Board of Governors Meeting Minutes

*By: Dan Carington*

Every month prior to the main program, the Boston Chapter of ASHRAE's Board of Governors (BOG) meet to discuss Chapter business. This article, based on the secretary's meeting minutes, shall serve as an informative summary for members as to what is happening behind the scenes of the Boston Chapter. Please feel free to contact me with any questions or for additional information.

Meeting Date: January 14, 2016

Review of December Meeting Minutes

Each Board of Governors meeting begins with a review and eventual vote to approve the previous month's meeting minutes. Any items that required follow-up are updated and closed or are determined to be carried forward once again.

The meeting minutes were approved for December 2015.

2015/2016 Schedule

Discussion of our January technical session and main program were approved for 1 PDH credit.

Discussion of our new Boston Chapter website on review of its first run for January 2016 fared well. Further discussion of the new Product and Energy Show. Discussion on the Roster and Product Guide and how it will be similar to Rochester Chapter Guide. Discussed updated YEA Leadership weekend and who would be attending in February. A new tour of Jack's Abby Brewery is being reorganized; a date is tentative to be announced.

Additional Miscellaneous Items Discussed

The following topics were briefly discussed:

- **2015/2016 Budget** - The budget for the 2015/2016 ASHRAE Boston Chapter was discussed by treasury and reviewed by attendees.
- **Committee Chair Responsibilities** – Chapter President, Stacie Suh, suggested that all Committee Chairs stay on top of their Presidential Award of Excellence points accordingly.
- **Women of ASHRAE** - New committee starting up at Society level trying to get women involved in ASHRAE. Trying to get that down to the Boston Chapter. There will be Women in ASHRAE breakfast in Orlando, see date on the Women in ASHRAE Facebook page.
- **Other New Business** - A network event is scheduled at Stoddard's Pub in Downtown Boston on February 4th for all members.

# MEMBERSHIP PROMOTION

*By: Dan Carington*

Hello members, the February meeting is at Metro Meeting Center in Boston, our 2nd of 2 Membership Promotion Nights. Bring in a potential member or members to the meeting and network with everyone. As of January 24, 2016 our Chapter membership numbers increased by 54 new members since July of this 2015-2016 Society membership year, we lost 71 members due to cancelation. Please check your membership status to avoid being in that number. I would like to recognize the new Members that have joined us in the last 3 month:

| | | |
|---|---|---|
| Chad Smutzer, PE | Ralph Michael Ippolito | William Mace Vaughan |
| Fran Sabatino | Nick Lancaster | Christopher Nowark |
| Chris Pietrocarlo | Alex A Gilman | Peter Steven Westra |
| Eric Richards | Liz Desmarais | John Metuszek |
| Mark Luchini | Arry Charles | |

Welcome aboard Members, wishing you many years of partnership and success with the ASHRAE Boston Chapter. We are so looking forward to seeing everyone at our next Boston Chapter ASHRAE events and meetings.

Please share your experience as a member of the Boston Chapter. If you can, email me and tell us what ASHRAE has done for you since becoming a member. It is one of my goals to post this on our newsletter to let other members and potential members see the benefit of being a member beyond the books and standards that are at our reach. ASHRAE has been a large part of my career since my involvement and I am sure it has been for you too.

Any comments or questions, please feel free to contact me at dpc@brplusa.com. Looking forward to hearing from you.

## ASHRAE BOSTON UPCOMING EVENTS

Visit www.ashraeboston.org/upcoming-events/announcements.html for more information.

**February Networking**
When: February 4, 2016
Where: Stoddard's

**February Meeting**
When: February 9, 2016
Where: Metro Meeting Centers, Boston

**March Meeting**
When: March 8, 2016
Where: Metro Meeting Centers, Boston

**April Meeting**
When: April 12, 2016
Where: The Lantana

## BOSTON AREA UPCOMING EVENTS

**AFE Boston Chapter 33**
www.afechapter33.org

**IFMA Boston Chapter**
www.ifmaboston.org

**BOMA Boston Chapter**
http://www.gbreb.com/boma/

**Sustainable Performance Institute**
http://www.sustainable-performance.org/

**AFE Chapter 74-Worcester Area-Central MA**
http://chapters.afe.org/chaptersnew/index.cfm?chapterIndex=2

**USGBC Massachusetts Chapter**
www.usgbcma.org

**AEE New England Chapter**
www.aeenewengland.org/

**IBPSA Boston Chapter**
http://ibpsa-boston.com/

**New England Association**
**Of**
**Fire Protection System Designers**

**AMERICAN SOCIETY OF CERTIFIED ENGINEERING TECHNICIANS**

# Save the Date!

## 2016 NEAFPSD 25th Chapter Anniversary and Fire Protection Symposium
## March 9, 10 & 11, 2016
### Bartlett, New Hampshire

**All Chapter Members, Engineers, Contractors, Industry Manufacturer Representatives and their Friends and Family are welcome to attend our Chapter's 25th Anniversary and Symposium Event.**

***We have signed the Contract, reserved blocks of rooms and coordinated special features for this long awaited, well attended event.***

**We have locked in Outstanding Speakers including our Opening Night Dinner Speaker, founding father, Maurice Pilette, with an overview of our Chapter's 25 year History.**

There will be a formal Table Top Product Show
Technical Presentations with CEU Credits
Industry Networking with Latest Industry Topics and Products
Family Friendly Event with non-technical Activities to do around the Conference Center and nearby North Conway for Family and Friends
Welcome Bag Giveaway's, Free Raffles and Symposium Gifts to all Registered Guests

Your Symposium Committee has attached the registration form for all attendees and separate affiliate sign-up sheets for the Product Show and Symposium Sponsorships

There is an early Registration Raffle incentive noted on the Attitash Form for all registrations received and confirmed in good standing to Attitash by 3 PM, January 8, 2016.

Attitash
Grand Summit Hotel
& Conference Center

Early registration is very much appreciated
For all questions and information contact:
Paul Taylor - ptaylor@trojb.com

# Product Show 2016

*Jeff Schultz*

## The New Product & Energy Show 2016 Date:April 12,2016

The Officers and Board of Directors of the Boston Chapter of ASHRAE are pleased to extend an invitation to your organization to participate / exhibit at the 15th Biennial Product Show to be held at Lantana's in Randolph, MA on April 12, 2016.

This show has always been well attended in the past, not only by the general ASHRAE membership, but also by others who work in this field, including Facility Engineers, Hospital Engineers, Building Owners and Mechanical Contractors. The local New Product & Energy Show targets a specific audience where you can talk to the customers who matter to you. Admission is free to all attendees.

Below are the specific details of the New Product & Energy Show. Please email Jeff Schultz if you are interested in participating at this event. Also if you are interested in trailer spot opportunity, please contact Bill Garvey at wgarv@aol.com.

**D A T E :** **TUESDAY, APRIL 12, 2 0 1 6 ; 1:00 P.M. TO 8:30 P.M.**

Seminars 1:00 p.m. to 5:00 p.m.

Product Show 3:00 p.m. to 8:15 p.m.

Dinner 6:00 p.m. to 8:00 p.m.

**L O C A T I O N : LANTANA'S**
Routes 28 and 128
Randolph, MA

**E X H I B I T O R R E G I S T R A T I O N :**

**Price $900.00 per single booth; Multiple adjoining booths are available.**
Reservations are on a first come- first serve basis.
Registration forms will be mailed to vendors in early January.
If you have not exhibited at our show before, but would like to this year, please contact the show chairpersons to be placed on our permanent mailing list and have a blank reservation form sent to you.
Registration forms will be stamped in order of receipt. Booths are limited. ***Checks registration (completed) must be received by March 25, 2016. Please pay through Paypal:*** Ashraeboston@gmail.com ***with additional $25 processing fee for each booth.***

**B O O T H S :** Single – 8 feet wide x 6 feet deep

Double – 16 feet wide x 6 feet deep

A pre-printed sign will be attached to the backdrop with your company name.

a. Draped booths will be set up labeled prior to your arrival.
b. Tables 72" x 30" will be available upon your advanced request.
c. Electricity is available only upon your advanced request. No heavy electrical loads will be permitted. ***Please bring your own extension cords***.
d. Water and drains are **not** available.
e. Internet connections available at an additional charge through Lantana's.

**F O O D :** A complementary buffet dinner will be available to all attendees of the show.

**S E M I N A R S :** ASHRAE has reserved the facility for the entire day. Rooms are available for seminars from 3:00 p.m. to 6:30 p.m. Please contact Jeff Schultz at Jeffrey.Schultz@dpsgroupglobal.com if you are interested in providing a seminar. An outline of the seminar material will need to be submitted prior to approval. The seminars are intended to be educational and not commercial in nature.

Thank you for your interest and participation in the Boston Chapter – ASHRAE Product Show. You will receive a confirmation letter with additional information, plus some invitations for you to distribute to your customers who may not have received one. Please visit www.ashraeboston.org for more information and also for updated booth layout of exhibits.
Please contact me at Jeffrey.Schultz@dpsgroupglobal.com should you have any questions.

Sincerely,
**Jeffrey H. Schultz**

# Seminar Schedule

| ROOM | 3 - 4:30PM | 4:45 – 6:15PM |
|---|---|---|
| TBD | **Remarkable Long Term Performance in an Open Water Cooling System**<br>[ 1.0 P D H TBD]<br>Ed Block (MIT) | **Applying VRF**<br>[ 1.0 P D H TBD]<br>Rob Powell (Daikin) |
| TBD | **Ground Source**<br>[1.0 P D H TBD]<br>George Hu (AWE) | **C02 is not the enemy! How to improve IAQ by not reducing CO2**<br>[ 1.0 P D H TBD]<br>Charles Waddell<br>(GPS-Global Plasma Solutions) |
| TBD | **ASHRAE 62.1 Ventilation Stretegies for improving indoor air quality and meeting, or exceeding, the standard.**<br>[ 1.0 P D H TBD]<br>Nishant Kanapilly (Renewaire) | **Emergency Standby Generator Sets and CHP- Combined heat and Power using Gas power systems**<br>[ 1.0 P D H TBD]<br>Nick Paolo<br>(MTU Onsite Energy Corporation) |
| TBD | **Electrically Commutated Permanent Magnet Motors (ECPM) Technology**<br>[ 1.0 P D H TBD]<br>Steve Bistak (NovaTorque) | |

| ROOM | 9AM- 6:15PM |
|---|---|
| TBD | **WHAT HAPPENS WHEN YOU DON'T??? Wind, Seismic, Flood & Snow, Requirements of the International Building Code & Related Codes for Non Structural Components IBC 2009 & 2012 , IMC,IPC,NEC,NFPA, IFGC & ASCE 7-10**<br>[ 6.0 P D H TBD]<br>Richard Berger (VMC Group) |

*Unless noted above, the chapter is currently awaiting approval to grant CEU/PDH by The Practicing Institute of Engineering, Inc. (N.Y State)*

*We will be giving away great prizes.*
https://ashraeboston30.wildapricot.org/

# Innovative Buildings Recognized by ASHRAE with Technology Awards

ATLANTA – Wind turbines, subcooled glycol/water, geothermal wells, reuse of coil condensation water and a central heat pump water heating system are among the innovative measures used in the five buildings receiving ASHRAE Technology Awards.

The awards recognize outstanding achievements by members who have successfully applied innovative building design. Their designs incorporate ASHRAE standards for effective energy management and indoor air quality. Winning projects are selected from entries earning regional awards.

First place awards will be presented at the ASHRAE 2016 Winter Conference, Jan. 23-27, Orlando, Fla.

Following are summaries of the winning projects:

**Walgreens Net Zero Store**

Benjamin A. Skelton, P.E., BEMP, president, Cyclone Energy Group, Chicago, Ill., receives first place in the new commercial buildings category for the Walgreens Net Zero Store, Evanston, Ill. The building is owned by Walgreen Co.

The global retail pharmacy brand set out with a vision to create a scalable retail building design that would serve as a showcase for innovative, sustainable and high performance design to sustainability, architecture, engineering and retail communities. The store is designed to achieve net zero energy use by the National Renewable Energy Laboratory's most stringent definition of "renewable energy generated within the building footprint."

Among its innovative features are:

- 840 roof-mounted solar panels, generating enough energy to power 30 Illinois homes for a year
- two 35-foot-tall wind turbines, using winds from Lake Michigan to generate enough power to offset annual greenhouse gas emissions from 2.2 passenger vehicles
- geo-exchange energy obtained by drilling 550 feet into the ground below the store
- LED lighting and daylight harvesting
- carbon dioxide refrigerant for heating, cooling and refrigeration equipment
- energy efficient building materials

The owner set out with a vision to create a store that would be an innovation laboratory to test products, materials, systems and equipment that could be incorporated into prototype designs and retrofit throughout existing stores. Walgreens also wanted to share the results from the design, construction and ongoing operation of the store with the public, design community and even their competition. The store is designed to facilitate tours, including hosting executives and designers from their retail competition.

**DPR Construction's San Francisco Net Positive Energy Office**

Dylan T. Connelly, associate, Integral Group, Oakland, Calif., receives first place in the existing commercial buildings category for DPR Construction's San Francisco Net Positive Energy Office. DPR Construction occupies the building and has a 10 year lease with an option for 10 more years.

A national construction company, DPR sought to lead by example and transform the building industry with its retrofitted net positive 22,000 square foot San Francisco office. The office demonstrates the potential of the capabilities of integrated, innovated and replicable design, reducing energy use and improving indoor environmental conditions while being cost effective with today's technologies. The design includes a 118 kw rooftop photovoltaic system, all electric systems, operable skylights, building management system controlled ceiling fans, enhanced daylighting and living walls.

A net positive energy office building was achieved by reducing energy loads through use of efficient HVAC and electrical systems, and by installing photovoltaic and solar thermal systems on the roof to produce more energy than the building consumes. The target energy use index (EUI) was 23.6 kBTU/square foot/year and achieved a first year EU of 20.4, significantly lower than the code baseline of 49 EUI and 20 percent net positive energy. By retrofitting an existing building vs. building new, the project reduced its initial carbon footprint by over 70 percent.

Occupant comfort and health is also a top priority. A dedicated outdoor air system delivers 30 percent more ventilation than required ANSI/ASHRAE Standard 62.1-2010, *Ventilation for Acceptable Indoor Air Quality*. Heat recovery ventilators use MERV 8 pre-filters and MERV 13 final filters to filter out contaminants, increasing the efficiency of filtration and continuing to improve indoor air quality.

Another interesting feature is the use of dynamic elements, such as sunlight and plants, to activate the space, engage users and provide a connection of surroundings. Three living walls in the main lobby improve indoor air quality by absorbing volatile organic compounds while also increasing the overall wellbeing for occupants.

**Anne-Marie Edward Science Building – John Abbott College**

Nicolas Lemire, Ing., HFDP, president/principal, Pageau Morel and Associates, Montreal, Quebec, receives first place in the new educational facilities category for the Anne-Marie Edward Science Building at John Abbott College, Sainte- Sainte-Anne-De-Bellevue, Quebec. The building is owned by the college.

The contemporary six-story facility is named after a victim of a 1989 shooting at Ecole Polytechnique who was a science graduate of John Abbott. Anne-Marie Edward had been pursuing an engineering degree, and the community felt that through engineering, the pavilion demonstrated how humans are essential to environmental sustainability using applied knowledge and technology.

Energy diversification is accomplished with the use of geothermal wells, electrical heating and cooling, natural gas hot water heating and solar preheating. Potable water consumption is reduced with the use of low flow plumbing fixtures and resources

Continued on Next Page...

For Release: Jan. 5, 2016: Jodi Scott Public Relations/678-539-1140 or jscott@ashrae.org

...Continued from Previous Page

are maximized through reuse and recuperation:

- reuse of return air as compensation air in laboratories
- reuse of coil condensation water to humidify exhaust air
- recuperation on both general and laboratory exhausts
- recuperation through heat pump extraction and storage in stratified tanks
- recuperation of rainwater and fan-coil condensation water.

Laboratory ventilation requirements and large glazing surfaces can have devastating effects on energy efficiency. Nonetheless, the building's actual energy use is 45 percent lower than the baseline case and 10 percent lower than the proposed simulation.

**Seattle-Tacoma (Sea-Tac) Airport Pre-Conditioned Air**

Ken Warren, P.E., capital project manager, Port of Seattle (Wash.), receives first place in the new industrial facilities or processes category for the Sea-Tac Airport Pre-Conditioned Air project. The building is owned by the Port of Seattle.

The Port's Century Agenda sets a vision of reducing carbon emissions and air pollutants, increasing energy conservation, being socially and fiscally responsible and exceeding customer expectations. Its Pre-conditioned Air project is an important step in meeting an agenda objective of being the greenest, most energy efficient port in North America.

The system includes a pre-conditioned air plant (PCAP), piping and air handlers to provide cooling and heating for airplanes during boarding and deplaning to reduce costs for airlines, improved air quality, reduced noise and increased energy efficiency. The PCAP delivers sub-cooled glycol/water through 15 miles of piping to each of the 73 airplane gates in the existing facility, to serve the complete airplane HVAC&R needs. The system allows airplanes to shut off their jet-fueled on-board auxiliary power units (APUs), resulting in jet fuel savings and reductions in carbon dioxide and other gas emissions.

The reductions realized through the project include annual savings of:

- An estimated five million gallons in fuel; a $15 million savings in airline fuel costs
- 40,000 metric tons of greenhouse gases, the equivalent of removing 8,000 cars from the road
- 73 tons of nitrogen oxides
- Noise pollution from aircraft parked at the gates operating their APUs

**Stack House Apartments**

Jonathan M. Heller, P.E., principal engineer, Ecotope Inc., Seattle, Wash., receives first place in the residential category for the Stack House Apartments. The building is owned by Stack House Acquisition LLC.

The project includes two new multifamily buildings and one adaptive reuse of a historic building, which helped to retain some of the historical character of the neighborhood. The project covers an entire city block in the South Lake Union neighborhood of Seattle.

Innovative mechanical systems include a central heat pump water heating system in the largest of the two multifamily buildings, ductless heat pumps for 40 percent of the apartment units and common spaces, and rainwater catchment and reuse for urban agriculture on the roof. The historic building was included in the City of Seattle's pilot of an outcome-based energy code; the first program in the nation to predicate energy code compliance on post-occupancy proof of highly efficient operations. The project also participated in a stormwater treatment pilot project with Seattle Public Utilities with two biofiltration swales providing primary treatment to stormwater run-off from the Capitol Hill neighborhood before discharging to Lake Union.

The apartments are among the most energy efficient in the Pacific Northwest with measured EUIs of 19.8 kBtu/square foot/year for the West Building and 27.1 kBtu/square foot/year for the Southeast Building.

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its more than 54,000 members worldwide 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. More information can be found atwww.ashrae.org/news.

# ASHRAE Learning Institute

## 2016 Spring Online Course Series

### 2 WAYS TO REGISTER

**Take 3 or more courses and save 15% off registration!**

**Internet:** www.ashrae.org/onlinecourses
**Phone:** Call toll-free at 1-800-527-4723 (US and Canada) or 404-636-8400 (worldwide)
**Note:** You may register up to 24 hours prior to an online course. Courses are in US Eastern Time.

**Combined Heat & Power: Creating Efficiency through Design & Operations**
Mon, March 28, 2016 – 1:00 pm to 4:00 pm EDT

**Commissioning Process & Standard 202**
Wed, March 30, 2016 – 1:00 pm to 4:00 pm, EDT

**Advanced High-Performance Building Design**
Mon, March 23, 2016 – 1:00 pm to 4:00 pm EDT

**IT Equipment Design Evolution & Data Center Operation Optimization**
Wed, April 6, 2016 – 1:00 pm to 4:00 pm, EDT

**Complying with Standard 90.1-2013: HVAC/Mechanical**
Wed, April 13, 2016 – 1:00 pm to 4:00 pm, EDT

**Laboratory Design: The Basics and Beyond**
Mon, April 18, 2016 – 1:00 pm to 4:00 pm, EDT

**Standard 188-2015 – Successfully Managing the Risk of Legionellosis**
Mon, April 25, 2016 – 1:00 pm to 4:00 pm, EDT

**Air-to-Air Energy Recovery Applications: Best Practices**
Wed, April 27, 2016 – 1:00 pm to 4:00 pm, EDT
**Instructor**: Paul Pieper

**Fundamental Requirements of Standard 62.1-2013**
Mon, May 2, 2016 – 1:00 pm to 4:00 pm, EDT
**Instructor**: Hoy Bohanon

**Variable Refrigerant Flow System Design & Applications**
Mon, May 16, 2016 – 1:00 pm to 4:00 pm, EST
**Instructor**: Dermot McMorrow

**The following courses are comprised of two parts. Registrants must attend both parts in order to receive CEU/PDH credits.**

**Exceeding Standard 90.1-2013 to Meet LEED® Requirements**
**Part 1**: Mon, April 11, 2016 – 1:00 pm to 4:00 pm, EDT
**Part 2**: Wed, April 20, 2016 – 1:00 pm to 4:00 pm, EDT

**Operations & Maintenance of High-Performance Buildings**
**Part 1**: Tue, May 17, 2016 – 1:00 pm to 4:00 pm, EDT
**Part 2**: Wed, May 18, 2016 – 1:00 pm to 4:00 pm, EDT

# ASHRAE HVAC Design Training

## 2 Courses, 5 Days of Intense Instruction

**Atlanta • Cleveland • Halifax • Hong Kong • Houston**
**Kuala Lumpur • Miami • Minneapolis • San Francisco • Vancouver**

### HVAC Design: Level I – Essentials - Registration is $1,264 ($1,009 ASHRAE Member)

Gain practical skills and knowledge in designing 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 $854 ($699 ASHRAE Member)

*HVAC Design: Level II — Applications* provides instruction on HVAC system design for experienced HVAC designers and those who complete the HVAC Design: Level I – Essentials training. The training provides information that allows practicing engineers and designers an opportunity to expand their exposure to HVAC systems design procedures for a better understanding of system options to save energy.

**Visit www.ashrae.org/hvactraining to register.**

# 2015-2016 Meeting Schedule

| Date | Main Meeting/ Tech Session | Speaker | PDH Credits | Meeting Manager | Location/ Special Night |
|---|---|---|---|---|---|
| **September**<br>Wednesday September 9, 2015 | TD Garden Dehumidification System Tour | Chris Trent- Siemens<br>Pat McDonald- Eversource<br>Andrew or Jason- DNC<br>David Trumble – Cannon Design<br>Enis Pacavar – Sylvania | | Mark Leonard<br>MCL@BRPLUSA.COM | TD Garden Boston, MA |
| **October** | Towards ZEB (Zero energy buildings) in Europe and Application of Radiant Heating and Cooling Systems | Per Heiselberg<br>Bjarne W. Olesen | 1.0 | Mark Leonard | Metro Meeting Centers, Boston—101 Federal St. |
| Tuesday October 13, 2015 | **Tech Session:** Passive Cooling with Increased Night Ventilation in Low Energy Buildings | Guilherme Carrilho da Graça , Annamaria Belleri & Per Heiselberg | | MCL@BRPLUSA.COM | Membership and Student Promotion Night |
| **November** | Net zero commercial buildings – how to design and maintain indoor air quality | Bill Turner HLTURNER Group | | Mark Leonard | Embassy Suites, Waltham |
| Tuesday November 10, 2015 | **Tech Session:** Changing Refrigerant | Steve Tafone | | MCL@BRPLUSA.COM | Research Promotion & Donor Recognition Night Joint Meeting with IAQA |
| **December** | ASHRAE SPC-188 Legionellosis: Risk Management for Building Water Systems | Tom Watson | | Mark Leonard | Embassy Suites, Waltham |
| Tuesday December 8, 2015 | **Tech Session:** Remarkable Long Term Performance in an Open Water Cooling System | Ed Block | | MCL@BRPLUSA.COM | Joint Meeting with ASPE |
| **January** | Electrically Commutated Permanent Magnet Motors (ECPM) Technology | Steve Bistak | 1.0 | Mark Leonard | Embassy Suites, Waltham |
| Thursday January 14, 2016 | **Tech Session:** Special Gas Venting Systems | Warren E Creamer III (Skip) / Atlantic Air Products | 1.0 | MCL@BRPLUSA.COM | Past President's & History Night |
| **February** | Infrastructure Resiliency Design in Healthcare. Post Superstorm Sandy | Steven Friedman | | Mark Leonard | Metro Meeting Centers, Boston—101 Federal St. |
| Tuesday February 9, 2016 | **Tech Session:** Power and Energy Metering | Brad Selmon | | MCL@BRPLUSA.COM | Membership Promotion, Research Promotion & YEA Night |
| **March** | Case Histories of Both Productive and Problematic Interactions Between Architectural Designs and HVAC | Lew Harriman | | Mark Leonard | Metro Meeting Centers, Boston—101 Federal St. |
| Tuesday March 8, 2016 | **Tech Session:** GroundSource Case Study | George HU | | MCL@BRPLUSA.COM | Joint Meeting with AEE |
| **April** | Product Show | Jeff Schultz | | Jeff Schultz | The Lantana |
| Tuesday April 12, 2016 | **Tech Session:** TBD | N/A | | Jeffrey.schultz@dpsgroupglobal.com | Student & YEA Night |
| **May** | Installation of Officers | William Tang | N/A | Event Committee/WT | TBD |
| Tuesday May 10, 2016 | | | | | Sponsors Recognition Night |
| **June**<br>Monday June 6, 2016 | Golf Outing | William Garvey | N/A | Golf Committee | Halifax Country Club, Halifax, MA |

# 2015-2016 BOSTON CHAPTER OFFICERS
# CURRENT BOARD OF GOVERNORS & CHAIRPERSONS

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