



**December 2016**  
**Volume 52, Issue 4**

**INSIDE THIS ISSUE:**

President's Message	2
ASHRAE Winter Conference	2
Speaker Bio & Topic	3
YEA Update	4
Corporate Sponsors	4
Future City Competition	5
2016-2017 Programs	6
CTTC Article	7
Member Advancement	8
New Members	8
2016-2017 Directory	8

**COSTS**

Fees are based on online reservations and prepayment.

Philadelphia Chapter Members:  
**\$30**

ASHRAE Society Members -  
Non-Chapter Members:  
**\$40**

ASHRAE Life Members:  
**No Charge**

Non- ASHRAE Member:  
**\$40**

Young Engineers (35 & under):  
**\$25**

Students:  
**\$10**

# QUAKER CITY CLIMATE

**Thursday, December 15, 2016**

Breakfast Meeting

“HVAC and Infectious Airborne Diseases ”

*presented by*

**William Bahnfleth**

Professor and Director of the Indoor Environment Center  
Department of Architectural Engineering  
Pennsylvania State University

[Click here](#) to Register

Registration Begins:	7:00 AM
Breakfast Served:	7:30 AM
Presentation:	8:00 AM to 9:00 AM

See [page 3](#) for more information on the presentation and speaker.

**LOCATION**

**The Union League**  
140 South Broad Street  
Philadelphia, PA 19102  
215-563-6500

For directions and parking information,  
check The Union League’s web site  
at [www.unionleague.org](http://www.unionleague.org).

**The Union League Dress Code**

Please see [page 6](#) for the dress code.  
The Union League reserves the right to refuse  
admittance to anyone not adhering to the dress code.

2016-2017

President

Casey Younkins, PE

President-Elect

Jeff Crozier, PE, CEM, LEED AP

Vice President

Mike Radio, PE, CEM, BEMP, LEED AP

Treasurer

Michael Calabrese, PE, CEM, LEED AP

Secretary

Tim Reinking

Senior Governor

Ashley Lester, PE, LEED AP

**Governors**

Dan Brown

Eric Feinschil

Sean Hughes, PE

Tim Reinking

Newsletter & Website Editor

James Piscopo, PE, LEED AP

Chapter Technology

Transfer Committee Chair

Eric Feinschil

Research Promotion Chair

Gary Debes

Basic School Coordinator

James Lill, PE

Refrigeration

Adam Ryan

Membership Promotion Chair

Jeff DeSipio

Student Activities Chair

Mike Magee

Program Committee Chair

Jeff Crozier, PE, CEM, LEED AP

Chapter Historian

Sean Hughes

Young Engineers in ASHRAE

Dan Brown

Public Relations

Ashley Lester, PE, LEED AP

Grassroot Government Activities

Edward Decker

Golf Outing Director

Tim Reinking

Honors and Awards Committee

Eric Feinschil

## PRESIDENT'S MESSAGE

Happy Holidays!

From our ASHRAE board of governors, we hope our members and their families have a safe and enjoyable holiday season. I want to thank those who could make it to our November meeting. We had two excellent presentations by Dr. Jin Wen and Phil Bartholomew, and we are grateful they were willing to present their work to our organization.

Our December meeting is our annual breakfast meeting, which will be held on the 15<sup>th</sup> at the Union League. This month's topic will be on HVAC systems and their connection to controlling the growth and spread of infectious airborne diseases in healthcare facilities. This topic has been in the news more than you'd like to see recently, with hospitals in the country experiencing fatalities related to mold and bacteria spreading in operating rooms, and is particularly relevant for our region with the density of medical facilities we have in Philadelphia that are constantly expanding and renovating. The presentation will be given by Dr. William Bahnfleth, 2013-14 ASHRAE Society President and Professor at Penn State. We are very pleased that Dr. Bahnfleth is able to join our chapter and present on this topic.

Looking forward to January, we'll have our annual Winter Social at the Wells Fargo Center when the Flyers take on the Toronto Maple Leafs on January 26<sup>th</sup>. There will be a YEA Happy Hour social prior to the game as well. Keep an eye out for invitations to those events just after the New Year. Also keep in mind that the Winter Conference is taking place in Las Vegas January 28<sup>th</sup> through February 1<sup>st</sup>. Several board members and chapter members will be in attendance; we hope to see you all out there.

Thanks as always for your continued support of ASHRAE. I look forward to seeing you all at our meeting this month.

**Casey Younkins, PE**  
Philadelphia Chapter President  
[c021@ashrae.net](mailto:c021@ashrae.net)



**ASHRAE Winter Conference**  
January 28 - February 1, 2017  
Las Vegas, Nevada  
[Click here for more information.](#)

---

**Thursday, December 15****Breakfast Meeting**

“HVAC and Infectious Airborne Diseases”

*Presented by*

**William Bahnfleth**

Professor and Director of the Indoor Environment Center  
Department of Architectural Engineering  
Pennsylvania State University

**Presentation Topic**

Concern regarding the risk of hospital acquired infections and the effect of the built environment on epidemics of drug - resistant diseases is increasing. The well -educated designer and owner needs to understand the mechanisms by which infectious disease is transmitted indoors, the extent to which HVAC system characteristics affect probability of infection, available means for controlling risk with demonstrated effectiveness. These topics are presented and discussed using the ASHRAE Board of Directors -approved Position Document Airborne Infectious Diseases as a framework. Pertinent scientific knowledge about modes of disease transmission is reviewed, its practical implications for control are discussed, and the three HVAC -related control methods identified by the Position Document: ventilation, particulate filtration, and ultraviolet germicidal irradiation, are presented and compared. General recommendations for reducing risk are provided and knowledge gaps that need to be filled are identified.

GBCI Approved | 1 CE Hour | 0920005385 AIA Approved | 1LU/HSW

**Speaker Bio**

William Bahnfleth is Professor and Director of the Indoor Environment Center in the Department of Architectural Engineering at the Pennsylvania State University (Penn State) in University Park, PA, where he has been employed since 1994. Previously, he was a Senior Consultant for ZBA, Inc. in Cincinnati, OH and a Principal Investigator at the U.S. Army Construction Engineering Research Laboratory in Champaign, IL. He holds BS, MS, and PhD degrees in Mechanical Engineering from the University of Illinois, where he also earned an undergraduate degree in music (pipe organ performance), and is a registered professional engineer.

At Penn State, Dr. Bahnfleth teaches undergraduate courses in HVAC fundamentals and controls and graduate courses in chilled water systems, hot water and steam systems, and indoor air quality. His research interests cover a wide variety of indoor environmental control topics, including chilled water pumping systems, stratified thermal energy storage, protection of building occupants from indoor bioaerosol releases, ultraviolet germicidal irradiation systems, and others.

He is the author or co-author of more than 150 technical papers and 13 books and book chapters. He consults on the design of chilled water thermal energy storage systems and has been involved in more than 20 projects world-wide.

Dr. Bahnfleth is a fellow of ASHRAE, the American Society of Mechanical Engineers (ASME) and the International Society for Indoor Air Quality and Climate (ISIAQ). He is a member of the Indoor Air Quality Association (IAQA), the International Building Performance Simulation Association (IBPSA), Sigma Xi, the American Society for Engineering Education (ASEE), and the Society of Building Science Educators (SBSE). He has served ASHRAE in a variety of capacities, including Student Branch Advisor, Chapter Governor, Technical Committee and Standing Committee Chair, and as Director-at-Large, Vice President, Treasurer, and 2013-14 Society President. He is the recipient of a 1st place ASHRAE Technology Award, Transactions Paper Award, and Distinguished Service and Exceptional Service Awards.

In 2016, he received the Penn State Engineering Alumni Society's World-Class Engineering Faculty Award.

---

## **ASHRAE Philadelphia Corporate Sponsorships Still Available!**

The Philadelphia Chapter invites your company to join as a Corporate Sponsor for the 2016-2017 year. Your firm's participation in this program would enable us to make a wonderful donation to ASHRAE Research Promotion which includes over \$ 1.5 million in local research funding.

Corporate Sponsors are listed on our web site, in our newsletter, and in our annual directory. They receive free copies of our directory and recognition at all of our events. With the ease of one payment, you may get all this, as well as free dinner tickets good for our monthly meetings, and make a valuable contribution to ASHRAE Research at the same time.

Since not all companies have the same financial capabilities or quantity of employees, we offer a few different levels of corporate sponsorship. Each level will receive the same types of benefits, with some differences in quantities and discounting.

We hope you will decide to join us as a Corporate Sponsor. If you are interested, please email us at [philachapter@mail.ashrae.org](mailto:philachapter@mail.ashrae.org). The Board of Governors thanks you for your continued support of ASHRAE. We hope that this year is successful for your firm.

---



### **YEA Update**

#### ***Scholarship***

We are asking that working professionals nominate young engineers at your firms for a YEA scholarship. These individuals should have shown outstanding performance in the HVAC&R industry and show an active involvement and interest in ASHRAE. We will be providing criteria to judge the nominees, and a winner will be selected to receive an award. Nominations should be sent to Dan Brown at [c021yea@ashrae.net](mailto:c021yea@ashrae.net). More details to come.

#### ***Social***

Our Fall YEA Social was held at South Bowl in south Philadelphia the week prior to the Thanksgiving holiday. Although the location changed, the event had a successful turnout. All 10 young engineers enjoyed food, drinks, comradery, and bowling on the private lanes located upstairs. We will be holding another YEA get together soon. Look out for further details in the upcoming newsletter.

---

Did you know there are free design guides available on the ASHRAE web site?  
The regular technical article is not the only place to get great free information each month.  
Take a few minutes to log on and see the variety of design guides available to download at no cost.  
The design guides can be located by using the link below.

<https://www.ashrae.org/standards-research--technology/advanced-energy-design-guides>

### Future City Competition

Hello from Future City Philadelphia!

The program is going strong with 48 schools registered. It is now getting down to the wire. The first submissions, the Virtual City and Essay, is due December 19<sup>th</sup>. We are still looking for volunteers to judge these two submissions. This is something you can do on your own time. The information will be emailed to you within a couple of days of the submission due date. Judging is to be completed by mid January. For more information, please click on the following link, <http://www.futurecityphilly.org/fcvolops.html>

There are still some schools that need a mentor. Even with only a little more than a month to go, it is always helpful to have a mentor to make that final push. The following schools can use a mentor.

The Anderson School	Eagleville, PA
East Norriton Middle School	Norristown, PA
Hedgepeth Williams Elementary	Trenton, NJ
Holy Angels School	Newark, DE
Holy Family Regional Catholic School	Levittown, PA
JR Fugett Middle School	West Chester, PA
Keith Valley Middle School	Horsham, PA
Sacred Heart	Havertown, PA
Southern Lehigh Middle School	Center Valley, PA
Southern Middle School	Sinking Springs, PA
St Albert the Great	Huntington Valley, PA
St Elizabeth Parish School	Uwchlan, PA
St Joseph the Protector/Abington	Glenside, PA
St Mary	Schwenksville, PA
Texas Avenue School	Atlantic City, NJ

If you are interested in working with any of the schools listed above, please let me or Mike McAtee (Mentor Coordinator) [mjmcaatee@urbanengineers.com](mailto:mjmcaatee@urbanengineers.com) know as soon as possible. We will get you in touch with the team’s teacher.

We are also still need more preliminary judges, special awards evaluators and general volunteers for the day of the competition, which is Saturday, January 21<sup>th</sup> at Archbishop Carroll High School in Wayne, PA. Preliminary judges and special awards evaluators are needed for the morning session of the competition. General volunteers are needed throughout the day to help organize the schools, get the schools to the judging rooms, collect scorecards, etc.

Please visit our website at [www.futurecityphilly.org](http://www.futurecityphilly.org) and “Click here to sign up as a Volunteer” on the top left of the page. There you can register to be a mentor, judge, or general volunteer.

Any questions please contact me via e-mail or phone. Please feel free to forward this e-mail to your friends, co-workers, and technical society members.

Karen R. McManuels, PE  
Philadelphia Regional Volunteer Coordinator  
**Associated Engineering Consultants, Inc.**  
610-688-3980 x132  
610-389-5692 cell  
[volunteer2015@futurecityphilly.org](mailto:volunteer2015@futurecityphilly.org)

**PHILADELPHIA CHAPTER PROGRAMS CALENDAR 2016-2017**

Date	Location	Topic	Theme
<a href="#">12/15/2016</a>	Union League	HVAC and Infectious Airborne Diseases By William Bahnfleth	Breakfast Meeting 7:00 AM
1/26/2017	Wells Fargo Center	Flyers vs. Toronto Maple Leafs	Social
2/16/2017	Dave & Buster's	Geothermal Heat Pumps presented by Howard Alderson	Student Night and YEA
3/9/2017	Fisher's Tudor House	Trade Show	
4/13/2017	The Wyndham	Presentation by Rachel McCarthy, CHOP	Students and Membership
5/15/17		Golf Outing	
5/18/2017	The Wyndham	Presentation by Tom Watson, Daikin	Past President's Night

*Program calendar is tentative and subject to change. Please refer to [ASHRAE Philadelphia Website](#) for up to date information. Advance registration and pre-payment are required before the meetings.*

We need your attendance!

If we are below our guaranteed level for attendees at our meetings, our treasury could be negatively effected. Our programs are designed around the membership's input and we all need to support these meetings to maintain

**The Union League Dress Code**

It is the intention of the Dress Code to provide a set of guidelines within which it is expected that guests will demonstrate discretion and good judgment. **The Union League reserves the right to refuse admittance to anyone not adhering to the dress code.**

Jackets are not required at breakfast. Business casual dress is permitted in the private meeting rooms.

Men: Business casual attire is defined as a collared shirt and slacks.

Women: Pants should be tailored and are acceptable when worn with a jacket or other garments which would be appropriate if worn with a skirt.

Unacceptable Attire: The following attire is never acceptable on the first or second floors of the League: jeans, denim wear, tee shirts, athletic wear, tank, halter, or jogging tops, shorts, baseball caps, sneakers, casual or beach footwear.

Please submit articles highlighting novel HVAC technologies to Chapter Technology Transfer Committee Chair Eric Feinschil ([c021cttc@ashrae.net](mailto:c021cttc@ashrae.net)) for consideration in future newsletters.

## The Care and Feeding of Sensorless Pump Control

By Andy J. Cripe, TBE

Aerodynamics Inspecting of Texas, LLC

*Reprinted from TAB Journal, Summer 2016*

A recent development in hydronic systems has been the emergence of “sensorless” pump control, offered by several manufacturers. Sensorless pump control typically consists of a pump packaged with a pump-mounted VFD (Variable Speed Drive), supplied and programmed by the manufacturer, offering variable-speed control of the pump without the need of a downstream differential pressure transducer.

The premise of sensorless pump control is that based on a given pump, impeller and a system curve, the VFD can calculate pump flow at any speed based on pump power consumption and can use this to keep the pump operating on the system curve. The challenge for the Test and Balance industry is how to deal with these animals so they function reliably and as-intended.

### Pump Curves

Hydronic balancing (after system control valves are opened to their design flow configuration) begins with setting the flow at the pump by measuring the pump shut-off head and using that figure to determine the pump impeller size. Once impeller size is known, the manufacturer's pump curve allows us to determine flow based on the pump head.

Using a recent middle-school project as an example, the installed secondary pumps were Armstrong 4300IVS-8 0408-050.0 which translates as a 4800 series pump 4x4x8 (3600 RPM) with a 50 HP motor. The pump is rated for 1065 GPM at 135 ft. head with a 7.11 in. impeller.

The premise of the sensorless pump technology is that for a given pump and impeller size and a given system curve, there is a unique pump head and flow for each combination of pump speed and power input. With a system curve defined, the pump VFD can calculate pump head and flow at any operating point and uses pump speed control to stay on the system curve. This replicates variable speed control with a downstream differential pressure transmitter installed without requiring its actual installation. Settings are also available for maintaining constant flow or constant head.

### Balancing Sensorless Pumps

For the purposes of this example, Armstrong IVS pumps will be used. IVS Sensorless pumps generally ship with the design system curve loaded into the VFD; however the curve is just the engineer's best guess at system head and is usually on the conservative side. This will result in pump speeds higher than necessary and added pump energy consumption, the same as a conventional system with the differential pressure setpoint set too high. Calibrating the setup requires determining the actual head required to meet design flow under design cooling conditions.

Typically, the only pump curves available to the test and balance crew on a project are the standard curve with the pump at full speed, showing the range of impeller sizes. The pump may not be programmed to run at full speed, so a jumper needs to be installed to bring the VFD up to 60 Hz. This is taken from an Armstrong brochure for IVS sensorless pumps.

[\(click here to read the entire article\)](#)



The Philadelphia Chapter  
of the  
American Society of Heating,  
Refrigerating and Air  
Conditioning Engineers, Inc.

994 Old Eagle School Road  
Suite 1019  
Wayne, PA 19087-1866  
P 610-971-2169  
F 610-971-4859

Visit  
our web site at:

[www.ashraephilly.org](http://www.ashraephilly.org)

Republication of material  
contained herein is expressly  
forbidden without official Chapter  
authorization. The Chapter does  
not speak or act for the Society.  
Any member with material to  
submit for inclusion in the  
*Climate* can send the information  
to:

Hope Silverman  
P 610-971-2169  
[hope@mmco1.com](mailto:hope@mmco1.com)

Material can include letters to the  
editor, member news, upcoming  
events, comments on chapter  
programs or issues, etc.

**NEW PHILADELPHIA CHAPTER MEMBERS**

**New Affiliates:**

None

**New Associates:**

Nicholas Ramondo  
Judd Vail  
Badal Patel  
Mike Gehris  
Frank Campisino  
Mary Catherine Conrad

**New Members:**

Paul Minotti  
John Lee  
Ellis G Guiles

**Membership Advancement**

If you are currently an ASHRAE Associate Member, becoming a full Member is easier than you think! The following count toward the required **12 points** to advance to full membership status. You must update your ASHRAE online biography and send an email to [membership@ashrae.org](mailto:membership@ashrae.org) to advance.

- Non-accredited degree = 4 points
- Accredited degree = 6 points
- PE = 4 points
- Industry experience = 1 point/year

**The New 2016-2017 Directory is Available!**

The latest edition of the Directory of Associations, Consulting Firms,  
and Manufacturers' Representatives  
in the Philadelphia Area is now available. It sells for \$23 each.

Send your check to Hope Silverman, ASHRAE, 994 Old Eagle School Road, Suite 1019,  
Wayne, PA 19087.

If you prefer to pay by credit card, please call Hope at 610-971-2169 or email her at  
[hope@mmco1.com](mailto:hope@mmco1.com).