April 2014

THE LONG ISLAND SOUNDER

ASHRAE Long Island Chapter, Region 1...*Founded in 1957* www.ashraeli.org

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

Inside this issue:

President's Message

Welcome to the April issue of the "Long Island Sounder". We thank all of those who attended last month's meeting. Thank you again to Evans Lizardos who gave us another enlightening "Back to Basics" Presentation on Design & Theory of Dedicated Outside Air Systems for Humidity Control. Thank you again to Ray Schmitt of Wales Darby along with Dave Reardon and Dan Goodwin of Greenway Environmental Management and their presentation of GeoThermal Systems – Design and Installation Considerations.

Thank you to Accuspec for sponsoring March's cocktail hour and to ADE for offering to sponsor the April meeting. If your company is interested in sponsoring a cocktail hour please contact Rich Rosner or myself.

Rich Rosner, our President Elect will be attending training on April 11th and 12th where he will be given a full training for his upcoming year as President. The training is pretty intense, but that guidance goes a long way. Rich has been "in training" all of these years as a BOG member, and I am positive he will be a wonderful leader.

Our 15th Annual ASHRAE Long Island golf outing will be held on Monday, May 5 at Cherry Valley Club in Garden City. We always have a great turnout so please don't wait to make a reservation. I want to emphasize that the level of success of the event is dependent on the contributions from our sponsors. We are looking for new and continued sponsors, whether they are individual or company, for the outing. They include the pro shop raffle prizes at dinner, food and beverage services on the course and giveaways during check in. This is a great event and we keep the per golfer fee to a minimum so everyone has the flexibility to give what they can.

Also, it's not too late to make plans to attend the Summer ASHRAE meeting in Seattle.

Registration for the ASHRAE Annual Conference is now open! The Conference will take place in Seattle, WA, June 28-July 2. The Conference addresses topics such as ground source heat pumps, operations and maintenance and indoor environmental quality, as well as the second annual ASHRAE research summit. Not to mention, social events, networking opportunities and technical tours.

I look forward to seeing everyone at the Long Beach Ice Skating Rink Tour. During this tour we will see the refrigeration system and hear about the storm damage caused from Super Storm Sandy and recovery. We are fortunate to have the local chapter of Refrigeration Service Engineers Society (RSES) joining us for this tour as well.

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CHAPTER MONTHLY MEETING

DATE:	**Tuesday, April 8, 2014**
TIME:	**ANNUAL FIELD TRIP** **SEE PROGRAM SECTION FOR DETAILS**
LOCATION:	**SEE PROGRAM FOR DETAILS**
FEES: Members - Guest -	**$40 per person** **$45 per person** ***(Includes Dinner Afterwards)***

Reservations requested, but not required.
Call (516) 333-7117

Long Island Chapter Officers & Committees

ASHRAE 2013/2014 OFFICERS

POSITION	NAME	PHONE	FAX	EMAIL
President	**Andrew Manos, LEED AP**	631.632.2791	631.632.1473	president@ashraeli.org
President-Elect	**Richard Rosner, P.E.**	631.737.9170	631.737.9171	president_elect@ashraeli.org
Vice President	**Thomas Fields, P.E., LEED AP**	212.643.9055	212.643.0503	vice_president@ashraeli.org
Financial Secretary	**Charles Lesniak, P.E**	516.484.1020	516.484.0926	financial_secretary@ashraeli.org
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Secretary	**Andrew B. Dubel, P.E.**	212.967.7651	212.967.7654	secretary@ashraeli.org
Board of Governors	**Richard Halley**	718.269.3809	718.269.3725	bog1@ashraeli.org
Board of Governors	**Lee Feigenbaum, LEED AP BD+C**	212.243.2555		bog2@ashraeli.org
Board of Governors	**Brian Simkins, LEED AP**	203.261.8100	203.261.1981	bog3@ashraeli.org

ASHRAE 2013/2014 COMMITTEES

COMMITTEE	NAME	PHONE	FAX	EMAIL
Programs & Special Events	**Richard Rosner, P.E.**	631.737.9170	631.737.9171	programs@ashraeli.org
Membership	**Lee Feigenbaum, LEED AP BD+C**	212.243.2555		membership@ashraeli.org
Chapter Technology Transfer (CTTC)	**Don Kane, P.E.**	631.737.9170	631.737.9171	cttc@ashraeli.org
Grassroots Government Activities Committee	**Charles Lesniak, P.E**	516.484.1020	516.484.0926	ggac@ashraeli.org
Newsletter Editor	**Liset Cordero**	212.643.9055	212.643.0503	editor@ashraeli.org
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Historian	**Thomas Fields, P.E., LEED AP**	212.643.9055	212.643.0503	historian@ashraeli.org
Student Activities	**Richard Halley**	718.269.3809	718.269.3725	sa@ashraeli.org
Young Engineers in Training	**Lee Feigenbaum**	212.243.2555		yea@ashraeli.org
Webmaster	**Richard Rosner, P.E.**	631.737.9170	631.737.9171	web@ashraeli.org
Nominating	**Michael Gerazounis, P.E., LEED AP**	212.643.9055	212.643.0503	nominating@ashraeli.org
Reception & Attendance	**Frank Paradiso** **Ken Mueller**	631.632.2791 201.395.3761	631.632.1473 763.231.6924	reception@ashraeli.org
PR & Engineering Joint Council of LI	**Andrew Manos, LEED AP**	631.632.2791	631.632.1473	pr@ashraeli.org
Golf Outing	**Peter Gerazounis, P.E., LEED AP** **Steven Friedman, P.E., HFDP, LEED AP**	212.643.9055 212.354.5656	212.643.0503 212.354.5668	golf@ashraeli.org

President's Message

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In addition to our tour this month, the Chapter on behalf of the Stony Brook University Student Branch will be hosting a Webcast at Stony Brook University. This presentation will be on Buildings in Balance: IEQ and Energy Efficiency and will feature industry experts who will identify the link between energy efficiency and Indoor Environmental Quality (IEQ) through integrated design process. Viewers will be able to recognize the importance of the four cornerstones of IEQ and how system selection can benefit both energy efficiency and IEQ. It will be held on Thursday 4/17/2013 from 1:00-4:00 PM at the Charles B Wang Center in Lecture Hall #2 and is open to any of our members and non-members to attend. Attendees will receive (3) PDH's or 3 GBCI Continuing Education Hours.

Andrew Manos, LEED AP BD+C
President - Long Island Chapter

Long Island Chapter - Past Presidents

1958	H. Campbell, Jr. PE	1986	Jerome T. Norris, PE
1959	Clyde Alston, PE	1987	Abe Rubenstein, PE
1960	Sidney Walzer, PE	1988	Michael O'Rouke
1961	Sidney Gayle	1989	Mel Deimel
1962	William Kane	1990	Robert Rabell
1963	Louis Bloom	1991	Gerald Berman
1964	Milton Maxwell	1992	Donald Stahl
1965	Will Reichenback	1993	Ronald Kilcarr
1966	Joseph Minton, PE	1994	Jerald Griliches
1967	Irwin Miller	1995	Walter Stark
1968	Walter Gilroy	1996	Joe Marino
1969	Charles Henry	1997	Norm Maxwell, PE
1970	William Wright	1998	Alan Goerke, PE
1971	Louis Lenz	1999	Frank Morgigno
1972	Ronald Levine	2000	Michael Gerazounis, PE, LEED AP
1973	Henry Schulman	2001	Ray Schmitt
1974	Myron Goldberg	2002	Steven M. Stein, PE
1975	John N. Haarhaus	2003	Andrew Braum, PE
1976	Richard K. Ennis	2004	Claudio Darras, P.E.
1977	Kenneth A. Graff	2005	Craig D. Marshall, P.E.
1978	Evans Lizardos, PE, LEED AP	2006	John Nally
1979	Albert Edelstein	2007	Peter Gerazounis, PE, LEED AP
1980	Ralph Butler	2008	Steven Friedman, PE, HFDP, LEED AP
1981	Robert Rose, PE	2009	Steven Giammona, P.E., LEED AP
1982	Timothy Murphy, PE	2010	Nancy Román
1983	Leon Taub, PE	2011	Carolyn Arote
1984	Raymond Combs	2012	Brian Simkins, LEED AP
1985	Edward W. Hoffmann		

ASHRAE Long Island Chapter

PAOE POINTS FOR 2013/2014

350Chapter Members	Membership Promotion	Student Activities	Research Promotion	History	Chapter Operations	CTTC	GGAC	Chapter PAOE Totals
296	500	505	1,270	325	1,300	910	400	5,210

Chapter Monthly Meeting - Program for 2013/2014

September 10, 2013 * At Westbury Manor Dinner Presentation – Characteristics of Throw (Overhead Air Distribution Fundamentals) Presenter: ADE - Frank Bergamini ****1 PDH**** **Membership Promotion Night**	**February 2014** **NATIONAL ENGINEERS WEEK** Feb 16 through Feb 22
October 8, 2013 * *At Westbury Manor* Dinner Presentation—Optimizing Efficiency of Multiple Hydronic Boiler Systems Presenter: Joel Southwell ****1 PDH**** **Resource Promotion Night** ***Back to Basic Session I - Evans Lizardos*** *****1 PDH***** ***"How to Select & Specify Heating & Cooling Coils"***	**March 11, 2014** * *At Westbury Manor* Dinner Presentation—GeoThermal Systems – Design and Installation Considerations Presenter: Ray Schmitt and Panel ****1 PDH**** **Joint meeting with LI-Geo / YEA Night** ***Back to Basic Session III – Evans Lizardos*** *****1 PDH***** ***"Design & Theory of Dedicated Outside Air Systems for Humidity Control"***
November 12, 2013 * *At Westbury Manor* Dinner Presentation—Seismic Design for Building Systems Presenter: Jim Sadler from Mason Industries ****1 PDH**** **Joint meeting with SMACNA** **Student Activities Night & YEA Night as well as Membership Promotion and Upgrade Night**	**April 8, 2014 (5 PM)** **ANNUAL FIELD TRIP** **Long Beach Ice Skating Rink** – See the refrigeration system and hear about the storm damage and recovery. ****1 PDH**** Dinner to follow at a local Restaurant with a "Sandy" story
December 10, 2013 * *At Westbury Manor* **HOLIDAY PARTY** Free Buffet Dinner for Members **VISIT FROM DRC - Joseph Furman**	**May 5th, 2014** * *Cherry Valley Club, Garden City, NY* **ANNUAL GOLF OUTING**
January 14, 2014 * *At Westbury Manor* Dinner Presentation- Automatic Flow Balancing Presenter: John Knowles ****1 PDH**** ***Back to Basic Session II - Evans Lizardos*** *****1 PDH***** ***"Design of Variable Air Volume Systems"***	**May 13th, 2014** * *At Westbury Manor* Dinner Presentation—Introduction to Ammonia Refrigeration Systems Presenter: Douglas T. Reindl, Ph.D., P.E. ****1 PDH**** **ASHRAE DISTINGUISHED LECTURER** **Student Activities Night / Refrigeration Night**
January 2014 ASHRAE Winter Meeting Jan 18-22 New York Hilton 1335 Avenue of the Americas, New York, NY	**June 10, 2014** * *At Westbury Manor* **Free Buffet Dinner for Members** **PAST PRESIDENTS NIGHT & OFFICER INSTALLATION** **STUDENT SCHOLARSHIPS TO BE AWARDED** **ASHRAE History Quiz and prize Give-A-Ways**
February 11, 2014 * *At Westbury Manor* Presentation #1—Leed Ver 4 Rating System & ASHRAE 191P Water efficiencies in Bldgs. Presenter: Rich Gerbe ****1 PDH**** Presentation #2—Desiccant Dehumidification System for Energy Efficient Temperature & Humidity Control Presenter: Mark Piegay ****1 PDH**** **Joint Meeting with USGBC and IFMA-LI** **Resource Promotion Night / Membership Promotion Night**	**August 2014** **Chapter Regional Conference (CRC) Region I** **Bi-State Chapter Hosting August 14-16, 2014**

Board of Governors Meeting Minutes

Attendees: Andrew Manos (AM); Rich Rosner (RR); Don Kane (DK); Richard Halley (RH); Brian Simkins (BS); Lee Feigenbaum (LF), Charles Lesniak (CL), Tom Fields (TF), Andrew Dubel (AD)

The meeting was called to order at 5:00pm by Andrew Manos – President. On a motion by RH (seconded by RR) the previous meeting minutes, as published in the *Sounder*, were approved. All BOG/Committee chairs were reminded to update their PAOE points each month. AM has booked the room for the webcast at Stony Brook University along with the fishing trip for June 20th.

President-Elect/Programs: RR is setup for President-Elect Training April11-12 in Troy NY. The next meeting was confirmed to be at the Long Beach Ice Rink. RR and DR to select dinner venue.

Chapter Technology Transfer: DK noted that the he is still waiting for RVC to add CRC points. DK and RR will prepare for Long Beach Field Trip presentation and submit for PDH approval.

Treasury: DK reported the current balance of $6,755.11. The penalty from the year ending June 2012 has been waived be IRS. Tax filing was submitted 2/15/14 for year ending June 2013 – IRS granted extension to 2/15/14. DK will proceed with newsletter invoicing.

History: TF reported articles are being submitted monthly.

Honors and Awards: BS noted that he has candidates for submission.

Research Promotion: RR reported that the Chapter has received $19,928 towards the goal, to date. This exceeds the goal of 14,900. High five goal is 22,514. Product Directory has been sent out for printing and will be available at April's meeting.

Membership Promotion: LF reported that the Chapter has 27 delinquencies, Tonight's meeting is YEA night. All board members to review their status.

Student Activities: RH reported that he visited SCCC to bring students to a Chiller teardown that was being performed on campus. RH noted SCCC wants to start student chapter and AM will help with petition paperwork to get into society for this year (by June). RH will be visiting SBU on 3/12/14;

Webmaster: RR reported that, in general, the website has been updated promptly. The FTP site has not been used much.

GOLF: AM noted that advertising for the golf outing has started and that we are looking for sponsors.

New Business: AM will make comment regarding proper meeting etiquette when speakers are giving their presentations. RR or AM will be Liaison with EJCLI for next year.

The next meeting will be held on April 8, 2014 at 4:00PM, Long Beach Ice Skating Rink

The meeting was adjourned at 6:00PM.

Andrew B. Dubel, P.E.
Chapter Secretary

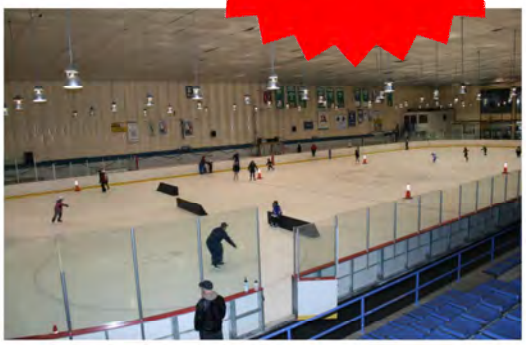
April Field Trip

ASHRAE Long Island Chapter

ANNUAL FIELD TRIP

TUESDAY, APRIL 8, 2014

Attendees Will Earn 1 PDH!



DATE:	TUESDAY, APRIL 8, 2014
ITINERARY:	5:00 pm: Tour of City of Long Beach Ice Arena – REBUILDING AFTER SANDY – Ice Rink Refrigeration Plant
FEE:	$40 per person(member), $45 (non-member),$15 Student - Includes Dinner and Soft Drinks (cash bar available) afterwards @ Lola's Kitchen, located at180 W Park Ave, Long Beach, NY 11561 (0.33 mi. due south from Arena, corner of Magnolia & W. Park Avenue)
LOCATION:	150 W Bay Dr, Long Beach, NY 11561
ABOUT THE TOUR:	The City of Long Beach Ice Arena was severely damaged by the ravages of Superstorm Sandy. A presentation will cover the extent of damages sustained, the repair/rebuilding effort and lessons learned to minimize damage from future storm event.

April Field Trip

ASHRAE Long Island Chapter

ANNUAL FIELD TRIP

TUESDAY, APRIL 8, 2014 – 5:00PM

CITY OF LONG BEACH ICE ARENA

150 W Bay Dr, Long Beach, NY 11561

Reservations are Required *!RSVP to Andy Manos – president@ashraeli.org*

By April 4, 2014

I would like to Attend (NAME):	
Phone #/email	

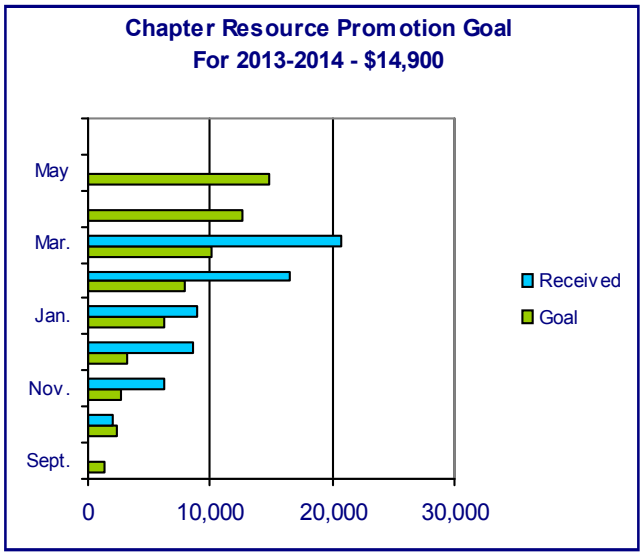
DIRECTIONS TO LONG BEACH ICE ARENA:

DIRECTIONS: TAKE LONG BEACH BLVD SOUTH OVER THE BRIDGE INTO LONG BEACH. GO WEST ON E. PARK AVENUE, PROCEED UNTIL IT CHANGES TO WEST PARK AVENUE. YOU WILL PASS THE LIRR STATION AND CITY HALL. ONE BLOCK WEST OF CITY HALL, TURN NORTH ON MAGNOLIA BLVD AND PROCEED TO W. BAY DRIVE. THE ARENA IS AT THE END OF MAGNOLIA. The entrance is on the North side of the building.

Research Promotion

The Product Directory should be available at the April meeting but since it is a field trip you may have to ask for your copy and I will dig it out from my trunk. We will have them at the May and June meetings of course where you can conveniently pick up a copy. It is already available on the internet at **http://ashraeli.org/productdirectory.html** . That's the Robert Moses Water Tower on the cover as seen from my camera from last year's ASHRAE fishing trip. This year's trip is on June 20th 2014 and you can sign up by contacting Andy Manos. It was a blast last year.

Fund raising wise we are doing well and we have collected $20,753 which brings us up to almost the Hi Five goal and about $1800 short of the High Five Challenge amount. I can taste that Challenge amount and would like to remind you we have three months to go to reach it. We will be running 50-50's at the rest of the meetings and of course we have the golf outing to help bring in some funds. Thanks so much for your generosity already and I hope to see a few more names appear there before the year is up in June. With PAOE points will are at 1951 for RP which has exceeded goal.



We have had sponsors for almost every meeting this year and are looking for sponsors for May and June still. It has really helped us keep the cost of our meetings down with the generosity of our sponsors. Just to mention again we had:

Meeting Sponsors, Thank You
Sept – Daikin
Oct – ATI
Nov – Trane
Dec – Holiday Party
Jan – MGE
Feb – Apollo
March – Accuspec
To sponsor yet:
April – ADE
May – Open
June - Open

This month's field trip/meeting should be fun. We are going to the City of Long Beach Ice Arena. The Arena suffered damage from Super Storm Sandy, along with the rest of the City, and has recovered from it nicely. I have asked if we can take pictures of our members on the Zamboni and they have given the ok, so dress accordingly and bring a camera. You will be enlightened by the tour and earn 1PDH if you need it and if the picture turns out well will have a nice memory for your wall. See you there!!

Again please help support ASHRAE in any way you can.

CONTRIBUTIONS CAN BE MADE IN THE FOLLOWING WAYS:

1) You can mail your checks, made out to ASHRAE Research Promotion, to:
Richard L. Rosner, P.E.
ASHRAE Research Promotion Chair
c/o Nassau Suffolk Engineering & Architecture, PLLC
801 Motor Parkway, Suite 103
Hauppauge, NY 11788

2) You can bring your check to any of the meetings and give it to me. I will mail it into headquarters.
3) You can contribute via PayPal from the ASHRAE LONG ISLAND web site just click on the donate button.
4) You can contribute directly on-line. www.ashrae.org

* Please make sure you accredit your contribution to the LONG ISLAND CHAPTER 006 *

Thank you again for all of your support! I hope to see you at the April Field Trip.

Richard L. Rosner, P.E.
Research Promotion Chair

CTTC - NOAA, NOAH and Other Natural and Man-Made Gotchas and Their Effect on HVAC Equipment

In a perfect world, the HVAC equipment we design, manufacture, install, service and/or use would never experience other than “nominal” conditions of weather, use and outside influences…It’s not… and they do! What are these conditions and what can be done, either before (as a prophylactic measure) or after (as a remedial response) to provide continued (or at least only briefly interrupted) operation of the equipment without compromising the integrity of the equipment or the economic limits of one's resources.

What are some of these conditions and events and how do we mitigate the threat they pose to continued operation and long lifetime of the equipment involved? What should we do AFTER an anomalous occurrence to facilitate speedy restoration of operation, while not overlooking longevity concerns?

These untoward events and conditions may be the result of nature, human intervention or a combination of both. They may be further categorized as electrical in nature, mechanical in nature or catastrophic events such as fires and earthquakes. Electrical issues may be further broken down as; loss of power, variation in supply voltages, lightning strikes and excessive fault current due to component failure or human error. Mechanical concerns include vibration due to seismic events, equipment imbalance, corrosion and freezing. Catastrophic events may include flooding, high winds (hurricanes or tornados) and explosions due to, for example, gas leaks.

Clearly, some of these occurrences are not practical to design for...should a gas leak result in the leveling of a structure, continued operation of the HVAC system is a moot point. However, the majority of the extreme conditions can be considered and planned for when it makes economic sense to do so. Some of this planning should be done as a matter of code compliance while some planning will require going beyond the code. Remember, codes are not the ceiling to reach, merely the floor to start from.

Let us consider flooding. This could be the result of a "natural" flood, such as a hurricane, a river overflowing its banks; or the failure of a water main. Flooding could also result from burst piping or damaged fire sprinkler heads within a structure. In the case of flooding "from the bottom up", elevation of the equipment is the simplest approach. After Superstorm Sandy, many localities which didn't heretofore consider this, added requirements for new and replacement mechanical and electrical equipment to be above the base flood elevation or be provided with means to prevent the entry and accumulation of water in the equipment. Of course, with the elevation of equipment, it is necessary to make provision for safe and OSHA compliant servicing of the equipment possibly requiring walkways and guardrails. The concern with installation height applies to both exterior equipment and equipment located, for example, in the basement of a building which could be flooded during a severe storm, water main breach or backing up of sewers. If the means to prevent inundation of the equipment requires a pump, care must be taken to ensure that a reliable source of power is available under all conditions. While Building Codes address the routing of piping to avoid dedicated spaces for electrical equipment, it is more difficult to find space in mechanical rooms totally free of overhead or adjacent piping which, in case of a failure, spew liquid onto and into the HVAC equipment. Keep in mind that the means to prevent flood damage (a retaining wall, for example) may act to contain liquid from other sources and may necessitate the use of check valves or one-way flood doors to permit drainage from within the equipment area, while not permitting "flood waters" from entering same. For equipment installed outdoors, at or near grade, not only is flooding a concern, but snowfall, if deeply drifted, can block air flow for that equipment. Again, elevation and barriers can alleviate much of this problem.

Much HVAC equipment is mounted on roof-tops. This greatly reduces the flood risk, but now leaves the equipment exposed to wind-driven objects and lightning strikes. If located in a hurricane prone area, it may be advisable to provide a protective parapet or barrier wall/roof for the roof-mounted air handling equipment to provide physical protection. This structure can serve also as a mounting location for air terminals installed as part of a lightning protective system. For equipment subject to exposure to lighting (both direct and nearby strikes) grounding and bonding take on a more significant role. It is not only necessary to ensure that a reliable path to ground exists to dissipate lightning energy, but one must make sure that multiple pieces of equipment are reliably bonded in order that no potential difference exists between them should one take a lightning hit. This latter concern takes on even more significance with the advent of networked control systems tying in the HVAC systems to a Building Management System (BMS). Any hardwired network connections may serve as a pathway for abnormal potentials during a lightning strike and may result in damage to ancillary equipment and controls located remotely from the roof-top units. Optical isolation of the networking connections should be considered in these applications.

Electric supply issues include voltage sags, either due to extreme local loading or utility brown-outs and spikes which can be the result of sudden removal of large loads (faster than the substation load-tap changer can respond to) or equipment which involves repetitive switching operations. The ultimate voltage sag is “no-voltage” due to failure of the utility’s generation, transmission or distribution system. While total loss of power can be addressed with back-up genera-

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CTTC - NOAA, NOAH and Other Natural and Man-Made Gotchas and Their Effect on HVAC Equipment (Cont'd. from Page 9)

tors and most sags and spike may be handled by adequate power conditioning equipment and uninterruptible power supplies (UPS), spikes caused by utility "crosses", when higher voltage lines come in contact with lower voltage power lines or communication lines, generally will require surge suppression devices, rated for the energy level available at the location. Utility tariffs generally will, except in rare cases, exempt them from liability for damage in these cases, so prevention is the order of the day.

While not necessarily an abnormal condition, extreme environmental characteristics should be considered when selecting the equipment to be used in, for example, a salt-laden-air environment or other corrosive atmosphere. Material selection should take into account both normal oxidation from the presence of atmospheric oxygen and galvanic corrosion due to dissimilar metals in the presence of an electrolyte (moist salty air). In addition to specifying appropriate materials, it is important to specify adequate installation methods, including but not limited to using anti-oxide pastes on electrical connections and wrapping them to seal them against the environment. Do not be lulled into a false sense of comfort by merely specifying everything to be made of stainless steel. When fabricated and installed in a manner that prevents contact with atmospheric oxygen needed for the constant renewal of the protective chromium oxide film (blind recesses or large overlapping surface areas), corrosion of stainless can be a concern, especially if the heat-affected-zone (HAZ) of welded fabrications have not be properly cleaned up after welding. Your choices for protecting metallic equipment is either; use materials which can generate a self-protecting coating (stainless steel or aluminum, for example), apply a coating to prevent contact of the material with moisture and air (paint or powder coat) or utilize a sacrificial coating (such as hot dip galvanized) which will protect the substrate until it is entirely consumed (even if minor "holidays" occur in the coating). Many engineered non-metallic materials are available today for some of the applications in HVAC equipment, such as fan blades, fan guards, enclosures and electrical connection boxes. The mechanical properties of these materials, especially resistance to UV from sunlight, are paramount when making a selection.

You have performed your due diligence in designing and installing the equipment and then it happens, the storm comes, the waters rise, the lightning strikes….what to do now to get things operational again. Note, it is important to make the distinction between merely getting equipment to function and…to function with minimal loss of expected lifetime. Sometimes it may only be necessary to get equipment up and running as a temporary measure until permanent replacement can be sourced and installed. This "fluff and buff" approach, which in many cases was necessary after Superstorm Sandy, will permit rapid restoration of various services, but will carry with it the onus of shortened lifetime of equipment.

After storm damage has occurred, or prior to if at all possible, equipment should be de-energized. If salt water or contaminated (such as by sewage) fresh water has contacted the equipment, a complete flushing with fresh water is called for, followed immediately by drying by forced warm air. If any water has entered ducts, immediate cleaning, as well as removal of any contaminated lining, will be necessary to stem the growth of mold and other bio-organisms. Most manufacturers of HVAC equipment will probably recommend replacement of any equipment which has had salt water contact. Similarly, if you check with most manufacturers of electrical equipment, you will find similar cautions. Any protective devices (circuit breakers, fuses or protective relays) that have suffered salt water ingress or have been contaminated by sewage should be replaced. Most motors which have been properly flushed and dried can be returned to service, after replacement of any bearings which were inundated. For smaller motors, economics may still favor replacement, but the need for resumption of operation may require utilizing the equipment on hand. Much of the electrical wiring supply the equipment may not be a type suitable for use in wet use applications. While appearing to be functional after drying out, much of this wiring will pose a future failure point. Should it be necessary to continue to use existing wires and cables after cleaning and drying, a program of insulation resistance measurement should be put into place to track the values on a routine basis to detect and degradation in insulation quality.

For any gas fired equipment, it will be necessary to ensure that all water, if present, has been purged from the supply and all parts of the gas train. Again, if salt water has contaminated critical components (regulators, valves etc) replacement will be the order of the day. Where the utility service has been shut down, coordination with the utility will be needed prior to turning on the gas supply to the affected equipment. Checking for water ingress will be even more critical for any ammonia-refrigeration equipment due to the corrosiveness of the ammonia dissolved in water.

While this is not intended to be an all encompassing treatise on preventing and recovering from damage due to abnormal operating conditions, one should take away the key points of; minimizing the exposure to damage by proper design and layout, maximize your chances for returning equipment to service by prompt action after an out-of-spec condition has occurred and understand the difference between quick restoration of operation and restoring equipment to a state where lifetime will not be sacrificed (or to acknowledge the need to plan for future replacement of the restored equipment prior to its accelerated failure.

Don Kane, P.E.
CTTC Chair - cttc@ashraeli.org

Membership

Through the past months we've enjoyed a series of lectures about some of the most sophisticated HVAC applications in the world. This month we are looking forward to a hands-on learning experience at the Long Beach Skating Rink. What a pleasure it will be to see what happens when thought is put into action!

We invite our members to bring guests to this meeting. Your Long Island Chapter is pleased to present this learning opportunity at a very unique venue, and we have no doubt that a larger audience will serve to enrich the learning opportunity. Ice skating rinks are unique in that they offer a variety of synergistic opportunities for energy savings. Everything from light fixture selection to the temperature of the ice matters. I have no doubt that many of these learning opportunities will serve everyone well as we collectively endeavor to design, build and commission increasingly advanced systems.

Unfortunately, none if this is possible if you allow your membership to lapse. Renewing is easy at www.ashrae.org. Just log in and click "renew!"

While you're online, don't forget to check our website at www.ashraeli.org for the most current information about your Long Island chapter.

Are you interested in being published? Do you have a testimonial about the benefits of ASHRAE that you'd like to share? If so, then please forward it to me at membership@ashrae.org for publication in our monthly newsletter.

Lee Feigenbaum, LEED AP BD+C
Membership Chairman

Student Activities

Spring has sprung (really?) well maybe not the weather but our students are making the turn and heading into the home stretch. Just about 6 weeks to go before they are done for the year. If you are in need of summer interns please contact me with you requirement and I can assisted you with a possible match.

Last month continued to be busy as we held a basic controls class for the Student Chapter at Stony Brook. I would like to thanks Andy Manos for his leadership with the chapter in scheduling their meeting and utilizing the committee as much as possible.

Our ASHRAE Long Island chapter student scholarship program is now accepting applications for our annual student scholarship. We have attached a copy of the application to this newsletter and if you need additional copies please Email me at rchalley@trane.com . Don't forget the deadline for applications is **May 1, 2014 (See Pages 12-13 for Application)**.

Richard Halley
Student Activities Committee Chair

Student Activities - Annual Student Scholarship

American Society of Heating, Refrigerating & Air Conditioning Engineers
Long Island Chapter, Region 001

ANNUAL STUDENT SCHOLARSHIP

The Long Island Chapter awards up to two (2) $1,000.00 or (1) $1,000.00 and (2) $500.00 scholarships annually to those who are well rounded and show an interest in pursuing an engineering career. Eligible entries for the 2013/2014 year must be submitted by **May 1, 2014**. Email address **rchalley@trane.com**

Application date:_____

Personal information:
Last Name First Middle

Home address City State Zip

School address City State Zip

Phone # E-mail address -Home

Cell # -School

Faculty Reference:
Name Address Phone #

1._____

Personal Reference:
Name Address Phone #

1._____

2._____

Education:
High School: Location Years Attended Graduation Date

College/University graduating Location Years Attended Date

College major GPA

Student Activities - Annual Student Scholarship

American Society of Heating, Refrigerating &
Air Conditioning Engineers
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Essay: Please describe your interests, activities, goals and why you deserve this scholarship (Attach additional sheets as necessary).

I also agree that my misstatement or omission of any information requested in this application shall be valid reason for rejection of this application. In the event I am selected to receive the application, I agree to attend the local chapter award dinner. The dinner will be free of cost to the award recipient.

No question on this application is asked for the purpose of limiting or excluding any applicant's consideration for reasons proscribed by federal, state or local law, and discussions are based entirely on knowledge, skills and ability. Qualified applicants are considered without regard to race, color, religion, sex, national origin, disability or age to the extend prohibited by law.

Applicant signed

Faculty advisor signed

Grassroots Government Activities Committee (GGAC)

As most of you know ASHRAE is no longer a US based society it has moved itself to a global society. During this past summer CRC ASHRAE wanted to start a new committee in their local chapters to help it grow globally so it created the GGAC. The main purposes of the GGAC is to serve as a communicator between the local ASHRAE chapters and national, serve as a communicator between the local ASHRAE chapters and other trade organizations, and to update local government officials on ASHRAE standards and technical issues. Please look at the ASHRAE's main GGAC Facebook page at www.facebook.com/ASHRAEGGAC for more information what the GGAC is doing nationally.

ASHRAE posted a free digital copies of their "Advanced Energy Design Guides Series online. These guidelines proved recommendations for energy savings of approximately 30% of the minimal requirements of ASHRAE Standard 90.1-1999. The categories for the guides are Small Hospitals
and Healthcare Facilities, Highway Lodging, Small Warehouses and Self-Storage Buildings, K-12 School Buildings, Small Retail Buildings, and Small Office Buildings. You will need to register yourself on the ASHRAE webpage prior to download and you will need to purchase print editions. Please visit the link https://www.ashrae.org/standards-research--technology/advanced-energy-design-guides/30-percent-aedg-free-download So for this ASHRAE season we had three joint engineering meetings. So far we've had our joint meetings with Long Island Chapter of SMACNA, Long Island Chapter of USGBC, and last month we had our joint meeting with LI-Geo. And we are looking to see if other organizations would like to join us for joint meetings for the next ASHRAE year.

ASHRAE Joins NAHB and ICC to Develop New National Green Building Standard

March 27, 2014 - The National Association of Home Builders (NAHB), building science society ASHRAE and the International Code Council (ICC), developers of the ICC Family of Codes for the built environment, today agreed to jointly develop the 2015 edition of the ICC/ASHRAE 700 National Green Building Standard. This is the third edition of the standard and the first time that ASHRAE has partnered on its development.

"ASHRAE's participation is welcome news for the home building industry," said NAHB Chairman Kevin Kelly, a home builder and developer in Wilmington, Del. "This cements the position of the National Green Building Standard as the preeminent green standard for residential construction."

In 2007, NAHB and ICC convened a consensus committee of home builders, code officials, product manufacturers, building science and energy-efficiency specialists and governmental representatives to develop the standard. It was approved in 2009 by the American National Standards Institute (ANSI) as the first green standard for residential construction, development and remodeling. Since then, the National Green Building Standard has helped define and advance sustainable home building, remodeling and development – a sector expected to represent as much as a third of the market by 2016. Now known as the ICC 700 National Green Building Standard (NGBS), it was updated in 2012 by a subsequent consensus committee and again approved by ANSI. NGBS has been used to certify more than 32,000 single- and multifamily homes and residential developments for reaching its established benchmarks for energy, water and resource efficiency, indoor environmental quality, home owner education and site development.

"As one of the nation's leading societies for building technology, ASHRAE brings years of experience and knowledge to the table, particularly in the areas of indoor environmental quality and energy efficiency," said ICC Board President Stephen Jones, CBO, and CEO Dominic Sims, CBO, in a joint statement. "ASHRAE's welcome involvement will help position the ICC/ASHRAE 700 National Green Building Standard even further ahead as the leading consensus standard in the industry."

Applications to serve on the NGBS consensus development committee are open through April 6. That's also the deadline to submit proposals to update or amend the new edition. The application and the proposal submission forms can be found atwww.homeinnovation.com/ngbs, the website for the Home Innovation Research Labs, which again is serving as secretariat, or administrator, for the standard development process. "ASHRAE is pleased to stand beside NAHB and ICC as a co-sponsor of ICC/ASHRAE 700," ASHRAE President Bill Bahnfleth said. "This collaborative agreement provides a path forward for ASHRAE to contribute its technical and standards expertise to support one of the most important sectors of the built environment – our homes. We look forward to this joint effort to promote sustainability in the residential sector."

Charlie J. Lesniak, P.E.
Grassroots Government Activities Chair

Grassroots Government Activities Committee (GGAC)

Great News: NY Governor Cuomo Pledges $1 Billion For Solar

In the last year, New York has become something of a solar powerhouse, jumping to 10th in the country in installed solar power in the third quarter of 2013. That growth is due not only to the precipitous drop in the cost of solar power in recent years—falling at least 40 percent since 2008—but also, in large part, to Governor Cuomo's NY-Sun Initiative. Since 2011, that's been a coordinated program to stimulate the solar marketplace, create clean energy jobs and businesses, cut solar prices, and reduce the Empire State's carbon footprint—doing so will make us less vulnerable to extreme weather events like Superstorm Sandy. NY-Sun has already produced impressive results. In fact, since the program began, more customer-sited solar photovoltaics have been installed in New York State than in the entire previous decade.

SUNY Buffalo's 750 kilowatt Solar Strand, designed by internationally renowned landscape architect Walter Hood, is just one of many solar installations across New York State that have been supported by Governor Cuomo's NY-Sun Initiative.

Now, as part of an expansion and extension of the program that the governor announced in the printed text of his State of the State address today, there's even better news for New Yorkers, who overwhelmingly support solar power: The already-impressive NY-Sun Initiative is about to become one of the most ambitious solar programs in the nation, with the governor committing, through a filing with the state's Public Service Commission, $1 billion to the program—that's right, $1 billion—over the next 10 years. (Governor Cuomo's text also announces a major new program to help K-12 schools throughout New York go solar. You can read more about that here.) The governor's goal is to install 3,000 megawatts of solar across New York. That's enough solar to power 465,000 New York homes, cut greenhouse gas emissions by 2.3 million tons annually—the equivalent of taking almost 435,000 cars off the road—and create more than 13,000 new solar jobs.

As I've said, the program has accomplished amazing things already. At colleges and universities across the state, for instance, it's helped fund solar arrays that cut energy costs and with them, the skyrocketing price of higher education. Better yet, these on-campus arrays are inspiring and educating a generation of young people about the benefits of pollution-free, renewable energy. (Most of these installation are run-of-the mill. But check out SUNY Buffalo's 750-kilowatt Solar Strand, designed by internationally renowned landscape architect Walter Hood.)

At manufacturing facilities, like Owens Corning's Bethlehem factory upstate, not only are NY-Sun-funded solar arrays producing clean energy, they're also helping keep New York companies competitive, nationally and internationally, in this still-difficult economy. Homeowners, too, have benefitted from programs that are making solar a more affordable investment than ever. The NY-Sun Initiative isn't just expanding the marketplace, though. A major function of the effort is to drive down the cost of installed solar power by establishing new, cost-effective and efficient practices and technologies. NY-Sun has set up its incentives in ways that yield the biggest bang for the program's buck. For large-scale solar arrays, for instance, NY-Sun requires a competitive-bidding process, so it can pick the lowest-cost contractor to design and install each system. That helps establish a going rate for solar in the state. Then, while some of its incentives are released during construction, the rest are paid out over the three years after the project is completed, to make sure the arrays work as promised. The program has been instrumental in creating and incentivizing a unified solar permitting process for municipalities that streamlines the currently complicated and cumbersome process of local solar permitting. The adoption of this permitting process has the potential to knock as much as $1,000 off the cost of a residential system. NY-Sun is also promoting innovative, cost-saving solar equipment and system components.

That might all seem a little dull to the non-wonks among us. But some of the NY-Sun Initiative's projects are simply mind-blowing. The upcoming web-based New York State Solar Map, funded jointly by NY-Sun and the U.S. Department of Energy and to be released later this year by the City University of New York, will allow residents to type their addresses into the website, and, with the click of a mouse, calculate their site's solar potential, along with annual energy cost savings, return on investment, local, state and federal incentives, and carbon reductions. The upcoming website, developed by CUNY and based on the amazing NYC Solar Map, is a transformative educational and outreach tool. It also has the potential to reduce solar costs for homeowners, businesses and institutions and cut the cost of customer acquisition for solar companies as well, by allowing potential solar customers to get the ball rolling without requiring an expensive initial onsite evaluation. Solar energy can be an important driver of economic growth in New York. The state already has more than 400 solar businesses at all levels of the supply chain that employ at least 3,300. The New York-Sun Initiative can help increase those numbers significantly, further cut the fast-dropping cost of solar, reduce our greenhouse gas emissions, and, produce electric power without the harmful air pollution that aggravates and sometimes even causes asthma among our kids.

We commend Gov. Cuomo's efforts to realize the Empire State's incredible solar potential and finally turn New York into the real solar powerhouse it deserves to be by expanding and extending his already-innovative NY-Sun Initiative. On this frigid, New York January afternoon, it's good to be led by a governor who knows how to bring up the power of the sun.

Grassroots Government Activities Committee (GGAC)

Governor Cuomo Announces $28.6 Million in Awards Under NY-Sun:

Albany, NY (March 3, 2014)

Governor Andrew M. Cuomo today announced $28.6 million in awards under the NY-Sun initiative, including 29 large-scale photovoltaic (PV) projects across New York, which will add 33.6 megawatts to the State's solar capacity, and eight innovative projects to reduce costs associated with solar installations. These awards underscore Governor Cuomo's commitment to scale up solar deployment across the State, sparking the significant growth in solar power and jobs as demonstrated by a recent independent report ranking New York fifth in the nation for the number of solar jobs per capita.

"With these awards, we aren't just investing in clean, renewable energy: we are investing in New York's future," said Governor Cuomo. "New York State is continuing to expand its clean-energy economy by partnering with the private sector to support innovative solar projects. The NY-Sun initiative has played an essential role in our efforts to grow the solar industry in New York and create cleaner communities across the State."

Earlier this month, The Solar Foundation, an independent, nonprofit solar research organization, ranked New York State fifth in the nation in the number of jobs per capita, with more than 5,000 jobs in 2013, moving it up from its seventh rank just last year.

Under NY-Sun:
A total of 299 megawatts of solar photovoltaic capacity has been installed or is under development in the past two years, which will result in the avoidance of approximately 145,000 tons of greenhouse gas emissions each year.
As a result of the steady decline in solar costs in the past two years, incentive amounts have been reduced, allowing for more solar projects to receive awards. In the past two years, the portfolio-weighted average incentive for large solar projects has dropped from $1.30 per watt in 2011 to 77 cents per watt today.
New York State is embarking on a new PV phase to continue to lower project costs through Community Solar NY, including K-Solar, which will demonstrate PV in schools and aggregate solar projects to "solarize" entire neighborhoods.

"Governor Cuomo's NY-Sun initiative is providing New Yorkers across the state with the benefit of clean solar power, whether through their businesses, municipalities or homes," said John B. Rhodes, President and CEO, NYSERDA. "These investments have multiple impacts, from reduced energy costs to lowered demand on the electric grid. This is a win-win for all New Yorkers."

Today's large-scale PV project awards for 29 projects, which total $25.8 million, are made under the NY-Sun Competitive PV solicitation, which provides incentives for PV systems larger than 200 kilowatts, and is administered by NYSERDA. These projects will leverage $58.6 million in private investment, resulting in roughly $84.4 million in infrastructure projects.

The eight solar cost-reduction projects, which total $2.8 million in awards, were funded by NYSERDA and the New York Power Authority. Projects were selected to support efforts to reduce soft costs, such as business costs, customer acquisition costs, installation costs, and permitting and inspection costs. These "balance of system" costs can account for more than half of the total installed PV system cost.

"Governor Cuomo's NY-Sun initiative underscores his commitment to renewable energy, advanced technology and the green economy," said Gil C. Quiniones, president and chief executive officer, NYPA. "Public-private partnerships like those receiving funding today show how innovative strategies for reducing installation and other costs will help accelerate adoption of more solar power systems statewide."

For more information on the NY-Sun initiative, visit www.ny-sun.ny.gov.

The NY-Sun awards announced today include: **Central New York**

The Central New York region will host three new solar projects, to be installed by Solar City Corporation, all at the Onondaga County wastewater treatment plant. Also, the Central New York Planning Board was awarded $445,000 to establish a collaborative PV system procurement program for local government, institutional and non-profit customers in Cayuga, Cortland, Madison, Onondaga and Oswego counties, and to provide technical assistance and outreach for local government officials and staff and for utilities on solar permitting, inspection, planning, zoning, interconnection and finance

New York City

New York City will host ten new solar projects, four in Staten Island, including two at Supreme Chocolatier LLC installed by Energy Systems and Installations Inc.; as well as three in the Bronx installed by OnForce Solar Inc.; two in Brooklyn, including a project at Paidge Steel and Time Warner Cable installed by Steel Equities and a project installed by SoCore Energy; and one project in Queens installed by Dynamic Energy LLC.

Cont'd. on Page 16

Grassroots Government Activities Committee (GGAC)

In addition, funding for four “balance of system” projects in New York City includes:

New York Solar Affordable Housing Program: Starting in New York City and expanding statewide, GRID Alternatives will develop the New York Solar Affordable Housing Program, which will eliminate all up-front customer expenses and most ongoing customer expenses for solar installations for low-income households. NYSERDA funding: $500,000.

Community PV Purchasing Program: Solar One, with Sustainable CUNY, will implement a community purchasing program in New York City using best practices from its solar pilot project. It will also develop a long-term business structure for community purchasing of solar energy systems. NYSERDA funding: $382,046.

Grid Ready Solar: City University of New York (CUNY), Con Edison and the National Renewable Energy Laboratory (NREL) will analyze the technical risk factors for grid interconnection in New York City and create public information identifying whether buildings are likely to face interconnection issues to help developers make informed decisions regarding project location and cost. NYSERDA funding: $318,568.

NYSolar Smart - SunShares: Vote Solar Initiative (VSI), working with Sustainable CUNY, will reach out to affinity groups – including private sector employers, local governments, universities and non-profit organizations in New York City and one upstate region – to offer group purchasing of residential solar projects at a reduced cost.
NYSERDA Funding: $224,832.

Hudson Valley

The Hudson Valley will host eight new solar installations, including five in Westchester County, with one at Carl Zeiss, Inc. to be installed by American Solar & Alternative Power LLC and one at Pearl Green Corp. to be installed by Solar Energy Systems LLC; as well as one at the Millbrook School in Dutchess County to be installed by SolarCity Corp. Also, BQ Energy LLC won an award to install a PV project in Putnam County and HudsonSolar (dba Hudson Valley Clean Energy Inc.) won one for a project in Ulster County, both of which are under development.

Also, the region will host a Westchester Solar initiative to lower the permitting and zoning barriers to solar installations in Westchester County municipalities and will arrange special pricing/group discounts for solar installations to reduce customer acquisition costs for installers, thereby reducing costs to consumers. Project partners are Energy Improvement Corporation (EIC), Pace Land Use Law Center, SmartPower, Northern Westchester Energy Action Consortium, Southern Westchester Energy Action Consortium, Abundant Efficiency LLC and Croton Energy Group. NYSERDA funding: $485,143.

Other regional projects will include:

WNY: Two sites in Buffalo, Erie County to be installed by BQ Energy LLC;
Finger Lakes: One site in Monroe County to be installed by Advanced Solar Products Inc.;
Mohawk Valley: Three new solar projects, including one to be installed at a City of Rome landfill by Global Resources Options LLC (dba groSolar) and one at the Oneida County DPW office and garage in Oriskany to be installed by Solar City Corp., and;
Capital Region: Three projects, one to be installed in Rensselaer County by SoCore Energy LLC and two to be installed in Washington County by SEC Northeast Solar One.

Statewide

Several awards were madeto statewide efforts to reduce balance of system costs , including:

Solar Marketplace: EnergySage has developed an online site called Solar Marketplace that helps homeowners, businesses and non-profits research and comparison-shop for PV systems. It will tailor the Solar Marketplace content to the New York market and promote the platform to potential solar customers. NYSERDA funding: $393,672.

Sunvestment: This project establishes third-party investment entities that enter into Power Purchase Agreements for small to medium-sized (10 kilowatt to 750 kilowatt) commercial solar projects, and makes the attractive returns of solar projects available to members of the local community. The award to Sunvestment Group, Keegan Associates and Phillips Lytle LLP provides funding for design of a web-based platform and refinement to legal documentation for demonstration projects. NYSERDA funding: $50,000.

Young Engineers in ASHRAE (YEA)

The pursuit of research and continuing education are central elements of ASHRAE's mission. While many professional organizations proudly declare that they are "learning organizations," ASHRAE is unique in that it places strong emphasis on opportunities for professional growth through learning. In particular, ASHRAE takes pride in preparing its younger members for future success. To that end, YEA is a committee in ASHRAE that is designed to focus on young professionals in the HVAC industry. YEA stands out among other organizations because it provides access to hands-on learning opportunities to study the application of HVAC technologies at a variety of interesting and sophisticated venues. If you are under 35 and haven't heard of YEA, you should definitely pay attention!

Let's take a moment to contemplate the learning opportunities abound at an ice rink. Ice rinks are unique in that they have a constant demand for both extreme heating and cooling. According to ASHRAE estimates a 34,000 square foot facility can consume anywhere between 800,000 and 2,400,000 kilowatts/ hour per year. Obviously, ASHRAE and its membership would prefer to see modern (or newly retrofitted) ice rinks fall on the more efficient side of that range. This is well within our purview. The two main factors that influence energy costs are 1) refrigeration systems, and 2) HVAC and dehumidification systems. It figures that where energy consumption is great, so too are the opportunities for energy savings. While there are opportunities to reduce energy consumption they may not all be intuitive…some may even surprise a seasoned HVAC professional. For example, making the ice colder can actually save energy.

Through our visit to the newly renovated Long Beach Skating Rink in April, the Long Island Chapter's YEA members will see first-hand how a modern facility heats and cools. Furthermore, you will have an opportunity to go behind the scenes and study the synergistic opportunities to increase efficiency and reduce operating costs. Come find out why air velocity and throw matters. Indoor Air Quality is another important factor in an enclosed arena. Long Island Chapter's YEA Members will see and learn why ice maintenance can contribute to high levels of contamination, and how to avoid these missteps should you be called upon to design, service, build, audit, or troubleshoot an ice rink.

In speaking to efficiency, Energy Star states that the first step to energy management is to "make a commitment." Through involvement in YEA, ASHRAE members are well on their way! YEA membership supplements knowledge with the hands on experience necessary to gain uncommon insight and achieve professional growth. Perhaps most importantly, we have fun doing it!

Lee Feigenbaum
YEA Chairman

ASHRAE™
Long Island
Chapter

History

Application of Electric Power in HVAC&R Systems

The First Century of Air Conditioning

Prior to the late 1800s, rotating shaft power was limited mainly to trains and ships. There were wind and water mills for pumping water and grinding grains and some steam-driven water pumps and ventilation fans. However, few people lived in windy regions or near fast-moving streams. Some ventilation fan designs for mine shafts were powered by man, wind or water pressure.

Early Refrigeration

Refrigeration was provided by ice from frozen ponds and rivers in the more northern climates. This ice was harvested and stored in winter and then sold during warmer weather. Ice trade became a major industry in the United States. Frederic Tudor of Boston started shipping ice to warmer climates in 1815. He became known in 1864 as the “Ice King of the World,” and Boston ice was shipped to every major seaport in South America, the Far East, China, the Philippines, India and Australia.

As pollution around the cities increased, particularly in the form of sewage run-off, the market emerged for artificial ice. Use of steam boilers to drive the thermodynamic process cycle and produce ice was growing rapidly. Daniel L. Holden and J. Andrew Muhl built and operated mechanical refrigeration plants in 1865 and 1867 in San Antonio, Texas. Holden designed improvements to the Carré absorption units of Paris, which made San Antonio in 1867 and New Orleans in 1869 the southern regional leaders in making artificial ice.

The areas that could harvest “natural” ice tried to convince people that the “artificial” ice was somehow unnatural and to be avoided. But the areas that were producing manufactured ice were able to convince people that “natural” ice was contaminated. As costs came into line with the natural ice costs, producers of artificial ice were able to make significant inroads into the northern monopoly on ice.

Ice delivery was hard work. Imagine lugging around a 300 to 400 lb block of ice on your shoulder like the young man above! By 1909, ice was produced in approximately

2,000 refrigeration plants.

Heating: From Stoves to Steam

Heating was provided by wood-burning fireplaces, which were later replaced with cast-iron radiant stoves that burned wood and/or coal. As cities became more populated, fire control became much more important. Fireproof construction was mandated by some city codes after several large and costly fires destroyed central districts.

Steam boilers became a standard for heating buildings. Central district steam plants that sold steam to buildings were developed. The steam boilers were large and expensive to operate and required supervision and maintenance. Coal-handling bunkers and stokers also constituted a portion of the overhead.

As steam-driven engines developed as a reliable means of rotating shaft power and heat sources, they began to be used as the power source for refrigeration and ventilation systems. Of the steam engines used for this purpose in 1914, more than 90% exceeded 15 million calories/hour.

Facilities that had a large steam boiler used the steam to provide for ventilation with large, low rpm centrifugal fans because they could convert the steam to rotary shaft work. Smaller, steam-driven piston engines were developed for the purchasers of central district steam to convert steam to rotary shaft horsepower for all manner of equipment.

Wood- and coal-burning steam driven vehicles were developed in the late 1890s. An experienced operator could achieve sustained vehicle movement or sustained rotation of the steam driven power take-off wheel from a cold start after about 1 ½ to 2 hours of hard work. The engines were quite powerful, but they weighed several tons. The Stanley Steamer automobile was fairly impressive in appearance, size and speed.

Cont’d. on Page 19

History (Cont'd. from Page 18)

Early Ventilation

In other areas, ventilation was almost non-existent. Natural ventilation was controlled by the building orientation and placement of windows to catch the prevailing breezes. High ceilings and large, open central staircases with ventilated domes provided some assistance to gravity and Mother Nature. Ventilation did not truly take off until after the mid-1880s, when the use of steam and electricity had spread. An exception was a kerosene powered fan sold by the Whirlwind Fan Company. The sales slogan for this unit boasted, "It will give you greater efficiency and enable you to do more and better work."

The electrical industry was growing rapidly. New patents and ideas for residential electrical appliances were being advertised as the best or most natural way of life. The world was rather unsophisticated and uneducated, but some of the biggest changes to affect humankind were taking place. The development of steam and electric-powered equipment surged ahead due to better understanding of electrical, mechanical and thermodynamic principles.

Direct or Alternating Current?

The competition between direct current (DC) and alternating current (AC) was fierce. Thomas Edison was a prime proponent of DC power because of his involvement in the design and marketing of direct current lighting, power distribution and motors. He felt that AC power was only good for electrocutions. DC power did provide a flicker-free light and could vary the speed of a motor by varying the voltage. Its major drawback, however, was its inability to transmit via wire over long distances.

George Westinghouse, Jr. was the principal proponent of AC power. The flicker problem with incandescent lighting was resolved by using more cycles per second, ranging from 133½ to 25 cycles per second. The various voltages and cycles for AC power transmission were being tested, and the ones that worked best were retained.

By 1914, most frequencies above 60 cycles per second had been abandoned, but it took another 20 to 25 years for 60 cycles per second power to become the standard in the United States. Some other countries settled on 50 cycles per second.

Generally, the only electrical load of a central power generator plant was the street lighting at night in the central business district. Some single-phase, induction- type motors with brushes and commutators became popular, especially among small industries in suburban towns.

Use of small electric fans, curling irons, irons for laundry, washing machines and hair dryers increased the use of electric power, particularly during the idle daytime period when the generators were under-utilized. This trend has reversed in the present day. Modern utility companies now offer premiums to shift the daytime power consumption to evening hours because their generating capacity is underutilized at night.

Single-phase induction and synchronous motors for AC power were popular with the public. To properly start synchronous motors, however, required experience. The power utility companies liked the synchronous motors because they could be operated with a 1.0 or higher leading power factor to help correct the lagging power factor of the utility distribution system. Automatic starters were developed later. Because it was difficult to control the motor speed, almost all the applications used belt-drive connections to drive the machinery.

Advances in Motor Technology

The physicist and inventor Nikola Tesla began working on AC electrical designs as a college student in Croatia during the 1870s. At this time, it was thought impossible to construct a motor without a commutator. Tesla worked as a telephone engineer before quitting to develop in his mind a complete alternating current power system with generators, transformers and motors. He then took a job as an electrical engineer, but no one was interested in his seemingly incredible ideas. He developed working models of generators and motors while on a long-term assignment in Strasbourg, then part of Germany. Tesla moved to the United States in 1887, at age 31, where he filed for 25 patents covering virtually the entire field of alternating current generation, distribution and polyphase, brushless induction AC motors. Shortly after, he sold his patents to George Westinghouse, who implemented widespread use of alternating current.

Cont'd. on Page 20

History (Cont'd. from Page 19)

Prior to 1891, there had been no demonstration of electrical transmission of any considerable amount of power over any considerable distance. A demonstration of the capability to transmit 100 hp of AC electricity a distance of 106 miles from Lauffen to Frankfurt in Germany was staged in 1891 for a technical exhibition. The wye-connected, three-phase generators were wound for 55 volts and driven by hydraulic turbines. A transformer increased the voltage to approximately 30,000 volts.

The three copper conductors were only 4 mm in diameter each. The incoming power was stepped-down to drive a 60-hp, four-pole polyphase induction motor at a speed of 1,200 rpm and supplied power for incandescent lights and some other small motors. The AC polyphase motor became more popular. The HVAC&R industry was able to capitalize on its popularity as the polyphase motor spread to small, commercial applications. Electric power costs in 1897 averaged about $0.10/kWh. The price dropped to approximately $0.03/ kWh in 1950 and is now approaching $0.10/kWh again.

Fans and pumps continued to be directdrive with several available rpm configurations. By 1925, the electric motor was the preferred method of drive, providing 62%, vs. 32% for steam engine drives, while diesel and gas engines were used 4% and 2% of the time, respectively. As refrigeration systems that were powered by electrical motors became available and the electrical infrastructure developed, the use of natural and artificial ice for refrigerating effect was discontinued. This was a welcome development for merchants and consumers who had suffered the messiness of the ice refrigeration systems. The *Ice Refrigeration Blue Book* listed 100 different refrigeration equipment options in 1909, which increased to more than 260 in 1911.

The use of hermetic motors evolved in the early 1930s, driven by the competition between General Electric, Frigidaire, Servel and Westinghouse to capture the greatest portion of the emerging home refrigerator market and the expanding commercial refrigeration market. Westinghouse applied a variant of the hermetic refrigeration compressor to air conditioning by making a console-style room air conditioner in 1933.

Conclusion

Comfort air conditioning has expanded from the wealthy residential and upscale commercial establishments to become a virtual necessity in contemporary times. It is possible in many areas to go from an air-conditioned home to an air-conditioned office in an air-conditioned car without experiencing more than a few moments of discomfort from the ambient outdoor temperature and humidity. And modern refrigerators require no one to carry hundreds of pounds of ice up rickety ladders propped precariously against the side of a building.

Thomas J. Fields, P.E., LEED AP
History Chair

SAVE THE DATE - MAY 13, 2014

SAVE the DATE – May 13, 2014
ASHRAE **Distinguished Lecturer**,
Douglas T. Reindl, Ph.D., PE will present:

"Introduction to Ammonia Refrigeration Systems" at our **May** Meeting (Refrigeration Night) – **1 PDH** will be earned by those attending.

March Meeting Photos











ASHRAE Golf Outing - Monday, May 5, 2014

15th Annual LI ASHRAE GOLF OUTING

Monday – May 5th, 2014

Place:	**Cherry Valley Club**
Brunch:	**11:00 am**
Shotgun:	**12:30 pm**
Reception:	**5:30 pm**
Dinner:	**6:30 pm**

This Event fills up fast, to guarantee a spot RSVP Soon.

(2) Foursome Limit Per Company.

Proper golf attire and shoes are required. Locker room and shower privileges are included.

CHECKS MUST BE IN BY APRIL 11, 2014 (No Exceptions)

Fax, Email or Mail entire sheet or cut this half and return

Name: _____ Company: _____

Address: _____ Phone: _____

City, State, Zip: _____ Fax: _____

I have read and understand the Cherry Valley Rules and Regulations (Signature): _____

Guest 1: _____ Company: _____

Guest 2: _____ Company: _____

Guest 3: _____ Company: _____

Fund raising is primarily through the contributions of our sponsors.

Golf & Meals:	**$ 350 pp x ____**		**= $_____**
Reception & Dinner:	**$ 130 pp x ____**		**= $_____**
Sponsor Dinner:	**$1,000**	☐ **Yes**	**= $_____**
Sponsor Lunch:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Reception:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Prizes:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Beverage Cart:	**$ 500**	☐ **Yes**	**= $_____**
Sponsor Hole:	**$ 200**	☐ **Yes**	**= $_____**

Please make check payable to:

ASHRAE – Long Island Chapter

Mail Checks To:

MG Engineering, P.C.

Attn: Peter Gerazounis, P.E. LEED AP

116 West 32nd Street

New York, NY 10001

Fax No.: (212) 643-0503

Email: peter.gerazounis@mgedpc.net

ASHRAE Golf Outing - Monday, May 5, 2014

Cherry Valley Club
28 Rockaway Avenue at Third Street
Garden City, NY
Telephone: (516)746-4420
Fax: (516)746-4421

Program:

11 a.m. Brunch in the Clubroom & Lounge – including Omelet station, deluxe deli board with rolls, chicken scarpiello, danish, croissants, bagels & cream cheese, sliced nova, fresh fruit and cheeses, Good Humor ice cream cart.

12:30 p.m. Shotgun Start Golf – Playing individual scores. Prizes for long drive, closest to the pins, low gross and callaway. Refreshments at the halfway house will include packaged snacks and whole fresh fruit, hot dogs, beer & soda. A snack cart will also be on the course. Carts, forecaddies, driving range, locker room and showers are all included in the price.

5:30 p.m. Following Golf - Open Bar with hot and cold horsd'ouvres in the Main Lounge. Fresh mozzarella with sundried tomatoes, cajun chicken, spring rolls, baby lamb chops, sesame chicken, turkey canapés, fried oysters, cheeses, fresh fruit, lobster halves, fresh clams & oysters, shrimp and crab claws.

6:30 p.m. Reception Dinner – Awards and raffle in the Main Dining Room. Carving stations of beef tenderloin & turkey breast. Chafing dishes of chicken & salmon featuring the chef's specialty, pasta station with marinara or vodka sauce, and choice of tossed or Caesar salad. Viennese dessert table following the dinner featuring pastries, fruit, cookies, assorted cakes and pies. Full beverage service throughout is included.

Women are also invited to attend and participate. There are locker room facilities available. The Cocktail hour and Dinner will also be available for those who cannot attend during the day for the golf.

Note: We are limited to 128 golfers. Openings will be filled on a first come-first serve basis. Corporate sponsorships will be available and raffle items will be welcome. Proper golf attire is a requirement for the golf course. Soft spikes are required. Please wear a jacket for the dinner.

Directions:

From the North Shore of Long Island: Take the Long Island Expressway to Exit 34 South (New Hyde Park Road Southbound), Grand Central Parkway (Northern State Parkway) to Exit 26 South (New Hyde Park Road Southbound) or Jamaica Avenue (Jericho Turnpike) Eastbound to New Hyde Park Road. Travel Southbound on New Hyde Park Road for approximately 5 to 7 miles to Stewart Avenue (You will cross over a set of railroad tracks). Take Stewart Avenue eastbound for approximately 1-1/2 miles to Cherry Valley Avenue. Travel Southbound on Cherry Valley Avenue for 1/2 mile, Cherry Valley Avenue becomes Rockaway Avenue. Continue on Rockaway Avenue and the entrance to Cherry Valley Club will be on your right.

From Local Points North: Take Old Country Road or Stewart Avenue to Franklin Avenue. Travel Southbound on Franklin Avenue to Fourth Street (just after crossing over railroad tracks). Turn right on Fourth Street and continue until it ends (Rockaway Avenue). Cross over Rockaway Avenue into the Cherry Valley Club's parking lot.

From the South Shore of Long Island: Take the Southern State Parkway to Exit 19 (Peninsula Boulevard-Hempstead/Garden City). Travel Northbound on Peninsula Boulevard for approximately 1/2 mile to President Street. Bear left on President Street (Northbound) for approximately one mile and cross over Hempstead Turnpike. President Street will become Cathedral Avenue. Continue on Cathedral Avenue for one mile to Fourth Street. Make a left on Fourth Street (Westbound) and continue until it ends (Rockaway Avenue). Cross over Rockaway Avenue into the Cherry Valley Club's parking lot.

From Local Points South: Take Hempstead Turnpike to Franklin Avenue. Travel Northbound on Franklin Avenue to Fourth Street. Turn left on Fourth Street and continue until it ends (Rockaway Avenue). Cross over Rockaway Avenue into the Cherry Valley Club's parking lot.

ASHRAE Golf Outing - Monday, May 5, 2014

Cherry Valley Club
Golf Outing Guidelines

To add the enjoyment of your day, we ask that you abide by Cherry Valley Club's basic rules of The Club, dress, golf etiquette & safety, golf carts, and care of the course.

Club Rules

1. **Smoking is not permitted in the Club House.**
2. **Cell Phones are permitted in the parking lot only. Use of Cell Phones beyond the parking lot is strictly prohibited. This includes the Golf Course.**

Dress Code

1. Jeans, designer or otherwise, are not acceptable on club property. This not only includes pants, but skirts, and cut-offs.
2. T-shirts and tank tops are not in keeping with the atmosphere of the club and as such, are not acceptable. The definition of T-shirt includes those with psychedelic coloring or suggestive printing.
3. If the Main Dining room is going to be utilized for any purpose, jackets are required.
4. Short shorts are not permitted on the golf course, practice tee or putting green by either male or female. Bermuda shorts of acceptable length are permitted. Jogging attire and denim pants are not considered proper attire for the golf course.
5. **Soft spikes** are mandatory at all times on our fine golf course. If your shoes need soft spikes, arrive early so we can change them. There is a nominal fee. There is **no** exception to this rule.

Golf Etiquette and Safety

1. Slow play shows lack of consideration for the players in your group and, more important, for the players behind you. Golf is made much more enjoyable if all players adhere to the following points in the conduct of play:

    - Minimize the time spent looking for balls by watching the flight of balls hit by everyone in your group. If a ball appears to be lost or out of bounds, hit a provisional ball before leaving the tee.
    - Signal the players behind you to play through if it becomes apparent that a ball will not easily be found and you are holding up play.
    - Don't rush addressing and striking the ball but move briskly between shots.
    - If your ball is some distance from the golf cart and the exact club selection is in doubt, take several clubs with you when you leave the cart to walk to the ball.
    - When play reaches the area of the green, park the golf cart(s) behind the green or adjacent to the next tee. Walk briskly off the rear or side of the green after putting out. Mark your score cards after your group is off the green.
    - Once a score of double par has been posted, pick up and move on to the next hole.

2. No player should play until the players in front are out of range.
3. If your ball appears headed for a player or group of players immediately shout "fore" in a loud clear voice.
4. No one should move, talk or stand close to or directly behind the ball or the hole when a player is addressing the ball or making a stroke.

ASHRAE Golf Outing - Monday, May 5, 2014

Cherry Valley Club
Golf Outing Guidelines (Cont'd.)

Golf Carts

1. No more than two people are to be in a cart at one time.
2. No more than 2 bags are to be carried on one golf cart.
3. Members and their guest must observe all cart directional signs and use cart paths and designated golf cart parking areas where provided.
4. Good judgment, reasonable care, and observation of club rules are expected of any member or guest when operating a golf cart. Damaged golf carts will be repaired at the responsible member's expense. Each member or guest who rents a golf cart agrees to indemnify and hold Cherry Valley Club harmless of and free from any and all damages, judgment, court costs, attorney's fees or other expenses incidental to and incurred by Cherry Valley Club which may arise from misuse of a golf cart by such member or guest.
5. Members and their Guests must keep golf carts at least 10 yards away from greens trees or traps. They should keep a reasonable distance away from soft or wet areas and they must respect directional signs.

Care of the Course

1. Before leaving a sand trap, a golfer should carefully rake and smooth over all holes and footprints made by him.
2. From tree to green, a player should ensure that any turf cut or divot displayed by him is replaced at once and pressed down, and that any damage to the putting green made by a ball is carefully repaired.
3. Golf bags should never be brought onto a green. The flagstick should be carefully handled to ensure that no damage is done to the hole or the putting green. Don't dent the green with the flagstick or by leaning on your putter.
4. In taking practice swings, players should avoid causing damage to the course by taking divots. This is particularly true on the tees and in the vicinity of the greens.
5. Only putters are to be used on the practice greens. A separate practice green adjacent the driving range is available for chipping and sand trap practice.

ASHRAE Webcast on "IEQ & Energy Efficiency" - April 17, 2014

ASHRAE LI Chapter has made arrangements for viewing of the April 17, 2014 ASHRAE WEBCAST on "IEQ and Energy Efficiency" at Stony Brook University's campus, Charles B. Wang Center, Lecture Hall #2. Seating is limited to 75 persons – please RSVP to president@ashraeli.org if you plan on attending.

Buildings in Balance:
IEQ and Energy Efficiency

April 17, 2014 | 1:00 PM–4:00 PM EDT

EARN PDHs! Attend this **FREE** webcast program and you may be awarded three Professional Development Hours (PDHs) or three AIA Learning Units (LUs).

The Presenters


2013–14 ASHRAE President William P. "Bill" Bahnfleth, Ph.D., P.E., Fellow ASHRAE, ASME Fellow


James W. Bochat, LEED-AP, NEBB Cx, NEBB TAB


Tim McGinn, P.Eng., LEED-AP, HBDP


Jerry M. Sipes, Ph.D, P.E.

Tentative Program

1:00 PM Part I — Opening Presentations, Roundtable, Q & A
2:35 PM Break
2:45 PM Part II — Roundtable, Presentations, Q & A
3:55 PM Closing

William P. "Bill" Bahnfleth, Ph.D., P.E., Fellow ASHRAE, ASME Fellow
Professor of Architectural Engineering | Director of Indoor Environment Center | The Pennsylvania State University
William Bahnfleth is the 2013–14 Society President. His presidential theme, "Shaping the Next," focuses on embracing our responsibility to "Our World." Bahnfleth currently chairs the Society's Board of Directors and Executive Committee, he is also a faculty advisor to The Pennsylvania State University – University Park Student Branch, as well as a Distinguished Lecturer.

James W. Bochat, LEED-AP, NEBB Cx, NEBB TAB
President | Commissioning Concepts | Phoenix, AZ
James Bochat is a NEBB Certified Commissioning professional, a LEED AP and also NEBB certified in Building Test & Balance. In his 40 plus years of experience he has provided hundreds of building owners with problem solutions and energy efficient installations for improved building operations. Bochat is currently a member of ASHRAE's GPC0.2 Committees, a member of the Professional Development Committee, and a member of the Building Performance Metrics committee.

Tim McGinn, P.Eng., LEED-AP, HBDP
Principal| DIALOG | Calgary, AB
Tim McGinn is a professional engineer and has degrees in both mechanical and electrical engineering. He is an experienced project manager and mechanical designer having been involved in major new building projects and significant renovations and planning projects for over 30 years. McGinn's real passion is a specialization in designing low impact/low energy systems for green buildings that maximize indoor environmental quality.

Jerry M. Sipes, Ph.D., P.E.
Vice President of Engineering | Price Industries, Inc. | Suwanee, GA
Jerry Sipes is a Professional Engineer with more than 20 years of experience in the HVAC field. He received his Ph.D. in Mechanical Engineering from Kansas State University, and is a registered professional in 2 states. Sipes is currently the vice chairman of ASHRAE Technical Committee 5.3, a member of Standard 195, chairman of Standard 200, and a member of Standard 79.

ASHRAE®

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Registration Fees: $259 (ASHRAE Member: $199) **Two-part courses:** $459 (ASHRAE Member: $339)

NOTE: You may register up to 24 hours prior to an online course. Course times are in Eastern US Time Zone.

Spring 2014 Online Courses

Commissioning

Commissioning Process in New and Existing Buildings
Part 1—Wed, March 26, 2014, 1:00 pm to 4:00 pm, EDT / Part 2—Wed, April 2, 2014, 1:00 pm to 4:00 pm, EDT
(Registrants must attend both parts in order to receive credits)
Instructor: Richard Casault, P.E., Member ASHRAE

Environmental Quality

IAQ Best Practices for Design, Construction and Commissioning IAQ Practices
Thur, May 1, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: Hoy Bohanon, P.E., Member ASHRAE, BEAP, LEED® AP

Troubleshooting Humidity Control Problems IAQ Practices
Mon, March 24, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: Lew Harriman, Fellow ASHRAE

Energy Performance

Basics of High-Performance Building Design
Thur, May 8, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: Tom Lawrence, Ph.D., P.E., Member ASHRAE, LEED® AP

Commercial Building Energy Audits
Part 1—Mon, April 28, 2014, 1:00 pm to 4:00 pm, EDT / Part 2—Wed, April 30, 2014, 1:00 pm to 4:00 pm, EDT
(Registrants must attend both parts in order to receive credits)
Instructor: Jim Kelsey, P.E., Member ASHRAE, BEAP, LEED® AP

Energy Modeling Best Practices and Applications
Part 1—Mon, May 5, 2014, 1:00 pm to 4:00 pm, EDT / Part 2—Mon, May 12, 2014, 1:00 pm to 4:00 pm, EDT
(Registrants must attend both parts in order to receive credits)
Instructors: Drury Crawley, Ph.D., AIA, Fellow ASHRAE, BEMP and Annabel Marston, Ph.D., Member ASHRAE, BEMP, LEED® AP

NEW! Evaluation Methods for High-Performance Green Buildings
Wed, May 7, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: Mark Stetz, P.E., Member ASHRAE, BEAP

HVAC Applications

Designing High-Performance Healthcare HVAC Systems
Wed, April 23, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: Dan Koenigshofer, P.E., Member ASHRAE, HFDP

Introduction to BACnet®
Mon, April 14, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: David Fisher, P.E., Member ASHRAE

Standards & Guidelines

Complying with Standard 90.1-2013 ES Practices
Part 1—Mon, April 7, 2014, 1:00 pm to 4:00 pm, EDT / Part 2—Wed, April 9, 2014, 1:00 pm to 4:00 pm, EDT
(Registrants must attend both parts in order to receive credits)
Instructors: McHenry Wallace, P.E., Member ASHRAE, LEED® AP and Joseph Deringer, AIA, Member ASHRAE, LEED® AP

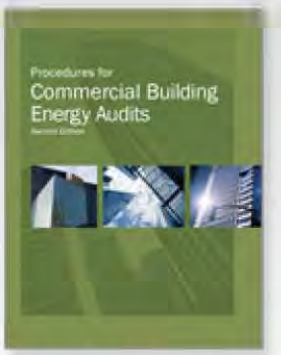
Fundamentals and Application of Standard 55 IAQ Practices
Mon, March 31, 2014, 1:00 pm to 4:00 pm, EDT
Instructors: Robert Bean, P.Eng., Member ASHRAE, Lawrence Schoen, P.E., Fellow ASHRAE, and Peter Alspach, P.E., Member ASHRAE, LEED® AP

NEW! Significant Changes to Standard 90.1-2010 ES Practices
Wed, May 14, 2014, 1:00 pm to 4:00 pm, EDT
Instructor: McHenry Wallace, P.E., Member ASHRAE, LEED® AP

The ASHRAE Green Guide

The ASHRAE GreenGuide, now in ePub format for use on mobile devices, is an easy-to-use reference with information on almost any subject that should be considered in green-building design. Each stage of the building process is examined, providing a comprehensive summary that will aid design engineers, contractors, architects and students in the design, operation and construction of sustainable buildings.

This expanded 4th edition contains a new chapter on sustainable sites and a revised chapter on indoor environmental quality. GreenTips found throughout highlight techniques, processes, measures, or special systems. Information is provided in dual units, and references and resources mentioned are listed at the end of each chapter for easy access.



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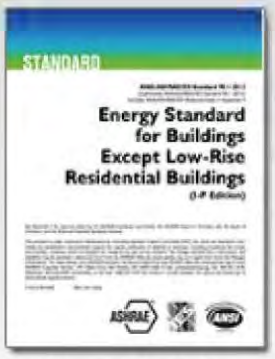

STANDARD 90.1-2013

Energy Standard for Buildings Except Low-Rise Residential Buildings, now available in I-P or SI units.

LEARN MORE

ALSO AVAILABLE

Reduce costs with *Performance Measurement Protocols for Commercial Buildings: Best Practices Guide*

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ASHRAE Long Island Chapter Polo Shirts for Sale

New ASHRAE Long Island Chapter Polo shirts are now available for purchase at our monthly chapter meetings:

Sizes Available:	**Small to 2XL**
Colors:	**Blue or White**
Pricing:	**$30 per shirt**

$$$ SAVE MONEY $$$

ASHRAE-LI is now offering **Ticket Books** for our Monthly Meeting/Dinner presentations. **$400 for a book of Eleven** (that's right….eleven, one better than ten) tickets for the price of ten member admissions. Tickets are valid until December of 2015 and may be used by members and non-members. For those of you who attend all or most of our meetings and for organizations who normally send large groups to the meetings, this is a great way to save a few dollars and speed up the entry process. For more information and/or to purchase ticket books, **please contact Don Kane at treasurer@ashraeli.org or call 631-574-4870**.

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Long Island
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