THE LONG ISLAND SOUNDER

November 2008

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	1,3
Meeting Information	1
LI Chapter Officers	2
Meeting Schedule	3
PAOE	3
Program	4
BOG Minutes	5
LI Past Presidents	6
Student Activities	6
History	7,13
Research Promotion	8
Membership	8
CTTC	9-12
ASHRAE Region I	14,15
Advertisements	16,17

President's Message

I would first like to thank all who attended our October meeting, this month we had near 50 participants, all of whom take a great interest in the HVAC industry. Once again, we had some new faces including new members joining our local chapter. Within our audience, I am proud to report that we had 8 past presidents and I would again like to thank them for coming to our meetings. I think they show great leadership through their continued support and the importance of Ashrae. Long Island Chapter Past Presidents as follows: 1978 Mr. Evans Lizardos, 1988 Mr. Michael O'Rourke, 1993 Mr. Ron Kilcarr, 1996 Mr. Joe Marino, 1997 Mr. Norm Maxwell, 2003 Mr. Andrew Braum, 2006 Mr. John Nally and 2007 Mr. Peter Gerazounis.

As I mentioned in September, there is a dire need for mechanical engineers in our region and so it is important to keep up the encouragement with our students and fellow industry colleagues. There has been a reported increase in student chapters around the globe so the encouragement and mentoring tactic has had quite an effect on the younger generation of college students and high school students who are potentially interested in a technical career. Since October was our student activities night, Mr. Rich Vehlow, region one student activities RVC visited us from Albany last month and reiterated the importance of student involvement in our industry. I would also like to recognize and thank Dr. Charles Forsberg, who is a professor in the mechanical engineering department at Hofstra University for his continued and endless support of our chapter along with his efforts in inviting the students to our local chapter meetings.

I would like to thank our lecturer Mr. Will Hayes of Miller Proctor Nickolas, who provided us with great information on heating hot water system applications including boiler selection and efficiency. With high price energy sources now in our country and the current state of the economy, it is prudent that we present our clients with the most efficient systems. This month, we welcome Dr. Tom Lawrence PhD, PE, LEEP AP, and Distinguished Lecturer from the University of Georgia, who will present us with High Performance Green Building Design . I encourage all of you to attend this lecture; it is going to be fantastic and a wealth of knowledge to industry professionals such as architects, facilities managers, building owners, applications and sales engineers, consulting engineers and contractors as well. The installation of green projects will help reduce the enormous amounts of energy spent in both creating construction materials and associ-

Cont'd on Page 3

CHAPTER MONTHLY MEETING

DATE:	**Tuesday, November 18, 2008**
TIME:	6:00 PM - Cocktails/Dinner 7:00 PM - Dinner Presentation 8:45 PM - Conclusion
LOCATION:	Westbury Manor South Side of Jericho Tpke. 25 Westbury, NY 11590
FEES: Members - Guest - Student -	 $35.00 $40.00 $15.00

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

Long Island Chapter Officers & Committees

ASHRAE 2008/2009 OFFICERS

POSITION	NAME	PHONE	FAX	EMAIL
President	**Steven Friedman, HFDP**	212.695.1000	212.695.1299	sfriedman@lilker.com
President-Elect	**Steven Giammona, P.E.**	516.827.4900	516.827.4920	srg@cameronengineering.com
Vice President	**Nancy Román**	516.256.4800	516.256.3299	nroman@airdist.com
Financial Secretary	**Carolyn Arote**	516.256.4800	516.256.3299	carote@airdist.com
Treasurer	**Brian Simkins**	203.261.8100	203.261.1981	bsimkins@accuspecinc.com
Secretary	**Andrew Manos, LEED AP**	631.592.2660	631.630.8883	andym22@optonline.net
Board of Governors	**Janeth Costa**	631.242.8787	631.242.7084	jcosta@apollohvac.com
Board of Governors	**Peter Gerazounis, P.E. LEED AP**	212.643.9055	212.643.0503	peter.gerazounis@mgepc.net

ASHRAE 2008/2009 COMMITTEES

COMMITTEE	NAME	PHONE	FAX	EMAIL
Programs & Special Events	**Steven Giammona, P.E.** **Richard Rosner, P.E.**	516.827.4900 631.737.9170	516.827.4920 631.737.9171	srg@cameronengineering.com rrosner@csfllc.com
Membership	**Carolyn Arote**	516.256.4800	516.256.3299	carote@airdist.com
Chapter Technology Transfer (CTTC)	**Andrew Manos, LEED AP**	631.592.2660	631.630.8883	andym22@optonline.net
Newsletter Editor	**Liset Peña**	212.643.9055	212.643.0503	liset.pena@mgepc.net
Resource Promotion	**Janeth Costa** **Andrew Braum, P.E. LEED AP**	631.242.8787 516.785.9000	631.242.7084	jcosta@apollohvac.com asb@frigidyne.com
Historian	**John Nally**	631.331.0215	631.928.4625	jn@atiofny.com
Student Activities	**Brian Simkins** **Carolyn Cammalleri**	203.261.8100 212.695.1000	203.261.1981 212.695.1299	bsimkins@accuspecinc.com ccammalleri@lilker.com
Webmaster	**Nancy Román**	516.256.4800	516.256.3299	nroman@airdist.com
Nominating	**Michael Gerazounis, P.E.**	212.643.9055	212.643.0503	michael.gerazounis@mgepc.net
Reception & Attendance	**Robert Fuchs**	718.599.1336		rfuchs@alnikmechanical.com
PR & Engineering Joint Council of LI	**Peter Gerazounis, P.E. LEED AP**	212.643.9055	212.643.0503	peter.gerazounis@mgepc.net
Golf Outing	**Peter Gerazounis, P.E., LEED AP** **Steven Friedman, HFDP**	212.643.9055 212.695.1000	212.643.0503 212.695.1299	peter.gerazounis@mgepc.net sfriedman@lilker.com

Editor's Note: *The appearance of any technical data, editorial material, or advertisement in this set of publications does not constitute endorsement, warranty or guaranty by ASHRAE of any product, service, procedure, design, or the like. ASHRAE does not warrant that information is free from errors, and ASHRAE does not necessarily agree with any statement or opinion in this set of publications. The entire risk of the use of any information in this set of publications is assumed by the user. Statements made in this publication are not expressions of the Society or of the Chapter and may not be reproduced without special permission.*

President's Message (Cont'd from Page 1)

ated MEP operating systems as well. Additionally, this month is Resource Promotion night, so if you haven't already donated, please bring a check with you to the meeting and continue with your tax free donation to Ashrae Research, it is always for a great cause.

Look forward to seeing you at our November meeting, please note it is on the 18th of this month due to the Veteran's Day Holiday.

Steven Friedman, HFDP
President - Long Island Chapter

Chapter Monthly Meeting - Program for 2008/2009

September 9, 2008 * At Westbury Manor - **1 PDH** Dinner Presentation - DDC Controls **MEMBERSHIP PROMOTION NIGHT**	**February 2009** **NATIONAL ENGINEERS WEEK DINNER**
October 14, 2008 * *At Westbury Manor* - **1 PDH** Dinner Presentation - Condensing Boiler Design **STUDENT ACTIVITIES NIGHT**	**March 10, 2009** * *At Westbury Manor* - **1 PDH** Dinner Presentation - Dedicated Outdoor Air Systems/ Energy Recovery **RESOURCE PROMOTION NIGHT**
November 18, 2008 * *At Westbury Manor* - **1 PDH** Dinner Presentation - Design/Build of LEED Projects **ASHRAE DISTINGUISHED LECTURER** **DR. TOM LAWRENCE, PH.D., P.E., LEED-AP** **RESOURCE PROMOTION**	**April 14, 2009** **FIELD TRIP - Blue Point Brewery**
December 16, 2008 Holiday Party - Westbury Manor	**May 4, 2009** * *Cherry Valley Club, Garden City, NY* **ANNUAL GOLF OUTING**
January 13, 2009 * *At Westbury Manor* - **1 PDH** Dinner Presentation - Mission Critical HVAC & Electrical Design **MEMBERSHIP PROMOTION NIGHT**	**May 12, 2009** Dinner Presentation - TBD **REFRIGERATION NIGHT**
January 24-28, 2009 ASHRAE Winter Meeting - Chicago, IL	**June 9, 2009** * *At Westbury Manor* **PAST PRESIDENTS & OFFICER INSTALLATION**
February 10, 2009 * *At Westbury Manor* **JOINT MEETING WITH SMACNA** Dinner Presentation - TBD **ASHRAE DISTINGUISHED LECTURER** **E. MITCHELL SWANN, P.E., LEED AP** **STUDENT ACTIVITIES NIGHT**	**June 2009 - TBD** ASHRAE Annual Meeting
August 2009 - Chapter Regional Conference Region I	

PAOE POINTS FOR 2008/2009

Chapter Members	Membership Promotion	Student Activities	Research Promotion	History	Chapter Operations	CTTC	Chapter PAOE Totals
297	225	655	0	300	790	325	2,295

November Program

You are cordially invited to our November 2008 Meeting…

Dinner Presentation

"The (Proposed) ASHRAE Standard 189.1 For High Rise Performance Buildings"

Presented by

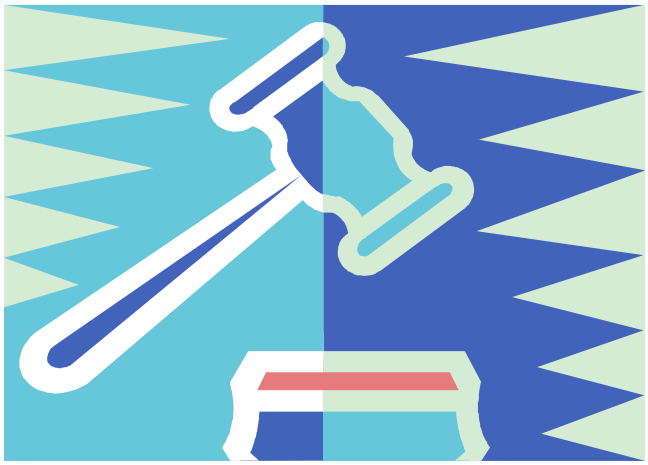
Dr. Tom Lawrence, P.E., PH.D., LEED AP
Public Service Associate
University of Georgia

ASHRAE DISTINGUISHED LECTERER

Attendees Will Earn 1 PDH!

DATE:	**TUESDAY, NOVEMBER 18, 2008**		
Time:	6:00 PM – Cocktails and Hors D'ouevres 7:00 PM – Dinner Presentation 8:45 PM – Conclusion	**Fee:**	$ 35.00 Member $ 40.00 Guest $ 15.00 Student
Location:	**WESTBURY MANOR** (516) 333-7117 Jericho Tpke (South Side), 3/10 of mile east from Glen Cove Rd., Nassau County, NY. **Directions are posted at @ www.ashraeli.org.**		
Presentation:	This month's seminar will review the ASHRAE standard and how it fits into the overall "sustainability" policy. Sustanable sites, water efficiency, indoor air quality and construction and operation plans will be reviewed and discuss. **This seminar will earn professional engineers 1 PDH.**		
About our Speaker:	**Dr. Tom Lawrence, P.E., Ph.D., LEED-AP:** Dr. Lawrence is a Public Service Associate with the University of Georgia, and has over 25 years of professional experience in engineering and environmentally related fields. Before going back for his Ph.D. in Mechanical Engineering at Purdue, he spent approximately 20 of those years in progressively more responsible engineering and management positions in industry and consulting. He is the chair of ASHRAE Technical Committee 2.8, "Building Environmental Impact and Sustainability", and is a member of the committee writing an ASHRAE standard on high-performance green buildings (Standard 189.1).		

Board of Governors Meeting Minutes



A meeting of the Board of Governors was held on Tuesday October 14, 2008 at the Westbury Manor. Present at the meeting were Steven Friedman, Steven Giammona, John Nally, Peter Gerazounis, Carolyn Arote, Brian Simkins, Janeth Costa Carolyn Cammalleri, Rich Vehlow and Andrew Manos. President Steven Friedman called the meeting into session at 5:04:

Programs- Steven Giammona discussed that Februarys joint meeting with SMACNA dinner presentation will be on LEED High Rise and that Mays dinner presentation will be on refrigeration or alternate energy.

Resource Promotion- Janeth Costa discussed that so far we have raised $945 for resource promotion.

Historian- John Nally is continuing to keep the history records up to date.

Webmaster- The website is up and running.

Treasurer- Brian Simkins gave a Financial Update. We currently have $22,682 in savings and $7692 in a money market account. Financials have been sent over to the accountant for tax filing and a financial audit will be preformed.

Membership – Carolyn Arote discussed that we have five new members as of 9/1. It was also discussed the PAOE points are to be updated monthly for membership promotion.

Student Activities- Brian Simkins discussed the strategy/planning for college and high school visits. It was also discussed the PAOE points are to be updated monthly for student activities.

Chapter Technology Transfer (CTTC)- Andrew Manos discussed that the PAOE points have been updated for the month

Open Discussion- ASHRAEs winter meeting will be held in Chicago Illinois.

There being no further business to come before the meeting, the meeting was adjourned at 5:52.

Andy Manos, LEED AP
Chapter Secretary

Long Island Chapter - Past Presidents

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

Student Activities

I am happy to report that we have been extended an invitation to attend the Hofstra Engineering Honors/ Awards Convocation. We have been asked to address the assembled Engineering students to speak about ASHRAE and ultimately recognize our ASHRAE Long Island Chapter scholarship winner Mr. Evan Schierwagen.

I have plenty of Student Activities propaganda from National to distribute. There is some great information available so please let me know if you have any schools or science fairs where we can present this information and get the word out about ASHRAE.

Last month was Student Night and was attended by our Regional Student Activities Advisor Richard Vehlow. Richard took the time to speak with our guests and we look forward to seeing him again in the future.

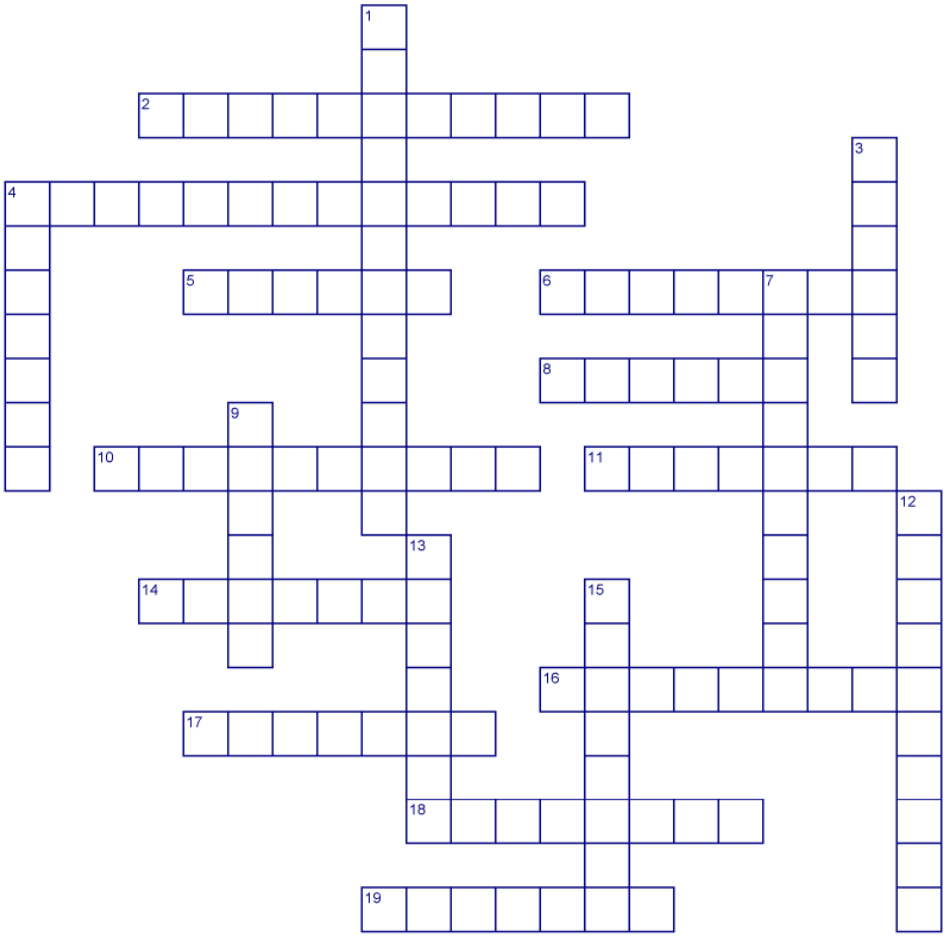
Apply Now for 2008-09 Scholarships
ASHRAE is now accepting applications for the Society's Engineering Technology Scholarships.

Please visit: http://www.ashrae.org/students/ for more information on all the Student ASHRAE activities and opportunities.

Brian Simkins - Student Activities Committee

Carolyn Cammalleri - Vice Chair

History - The History Challenge



ACROSS

2 Hotel hosting chapters silver anniversary dinner dance
4 Club hosting chapters annual golf outing
5 Proudly displayed at our monthly meetings
6 Chapters first president
8 Chapter president ten years back
10 April 2006 field trip to this laboratory
11 Location of recent presidential debate and our 1980 chapter meetings
14 April 2009 field trip
16 1975 Long Island CRC location
17 Picture on February 1991 ASHRAE Journal
18 Chapter president in 1973
19 Name of chapters newsletter

DOWN

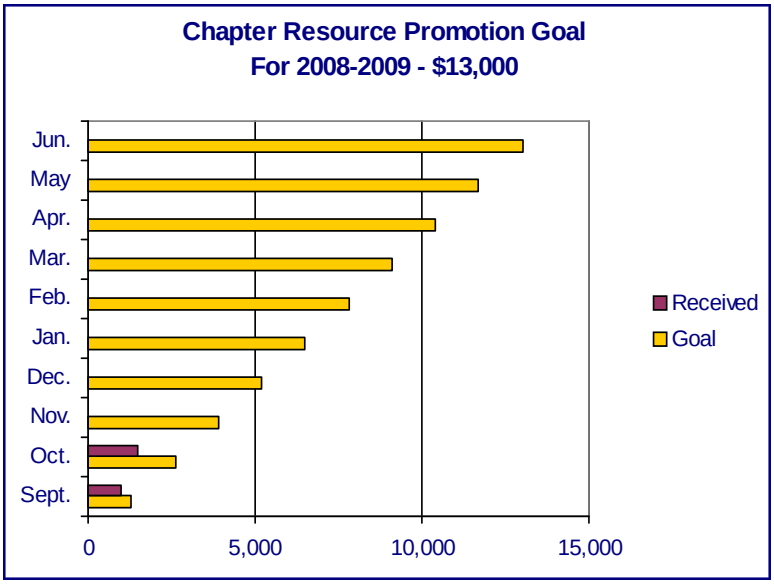
1 November 1980 chapter field trip to this airline terminal
3 1993 chapter historian
4 Received by our chapter in October of 1957
7 This newsletter format started in 2002
9 Recent special chapter anniversary
12 Location of April 1995 past presidents meeting
13 Chapter operating guidelines
15 1989 Long Island CRC location

John Nally
Chapter Historian

See Crossword Puzzle Answers on Page 13

Research Promotion

I would like to say thank you to everyone who has already made their contributions this year. Please mark your calendars – our **November 18th** meeting is **Resource Promotion Night**. We hope to have all our past donors, as well as future donors attend and contribute.



Our chapter is expected to raise approximately $13,000.00 towards the overall goal of $2.1 million dollars. Contributions can be made in two ways:

1) You can mail your checks, made out to Ashrae Resource Promotion, to:

Janeth Costa
Ashrae Research Promotion Chair
c/o Apollo HVAC Corp.
225 North Fehr Way
Bay Shore, NY 11706

2) You can contribute directly on-line. www.ashrae.org

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

Thank you again for all your past support!

Janeth Costa
Resource Promotion Chair

Membership

A quick reminder to those who are delinquent with your Society and Chapter dues, please send off your payment at your earliest convenience. Don't let your membership lapse.

We are starting off on the right foot with new member recruitment. We have 5 new members for this year, and we are only in the second active month for the 08-09 year. We are hoping to get some YEA members, which is any member under the age of 30. Please help us to get some new young members, as they are the future of our society. If you would like to help with recruitment please come and see me…you can join the committee.

See you at our next meeting.

Carolyn Arote
Membership Chairman

CTTC

Ammonia's Future

Ammonia has been the refrigerant of choice for industrial systems in many parts of the world for more than 100 years. It is cheap and readily available, provides high efficiency from relatively inexpensive equipment and is easy to use. It is also resistant to sloppy maintenance practices in many ways, as will be demonstrated in this article.

In recent years ammonia has been ap-plied in many applications where tradition-ally it was not common. This article re-views the progress that has been made in bringing ammonia systems to a wider market and explores other possible ap-plications that might be seen in the near future.

The move away from ozone depleting and global warming refrigerants has given a boost to system designs using ammo-nia. Recently, the environmental focus has shifted to energy efficiency, sustainability and carbon footprint. This has fur-ther reinforced ammonia's reputation as an eco-friendly choice for industrial systems, and has even sparked interest in ammonia from some unlikely quarters.

The interaction between ammonia and the environment is well understood, and it is unlikely to be subject to restric-tive legislation beyond the extent of the constraints that are already in place. In this sense it can be considered to be future proof.

Making Ammonia More Acceptable

Two significant safety issues need to be addressed when contemplating using am-monia as a refrigerant. The gas is acutely toxic if inhaled in moderate quantities, and has an unpleasant smell even at much lower concentrations, which could lead to complaints from operating staff or mem-bers of the public if a system leaks regular-ly. Also, mixtures of am-monia and air are flammable under certain circumstances, and while an ammonia deflagration does not have the de-structive power of hydrogen or petroleum, it is capable of causing burns and minor structural damage.

The first step in making ammonia more acceptable is educating the professionals who work with it. The majority of indus-trial accidents involving ammonia in refrigeration systems affect those in the immediate vicinity of the leak, such as pro-duction workers on a refrigerated process or maintenance workers servicing the ammonia system. No known fatalities or serious injuries are associated with refrig-eration systems where people were further than 66 ft from the source of leak-age. The injuries sustained in these incidents were all preventable, so it is clear that the most important factor in improv-ing ammonia safety is education and training of work-ers who come into contact with ammonia occasionally. A correct understanding of the refrigerant properties also ensures money is not wasted on unnecessary safety measures.

It surprises many people to learn that the gas detection and ventilation systems required for ammonia installations are not significantly different and not any more expensive than the equip-ment that should be installed for a large fluorocar-bon installation where a major leak would cause an asphyxiation hazard.

The system needs to be user friendly. Ammonia systems are already tolerant of poor maintenance practice. For exam-ple, ammonia systems have been reported in operation with several percent water in the refrigerant—even up to 26% in one case. Of course, the influence of water on the evaporating temperature has an adverse effect on plant efficiency. If similar abuse were attempted with R-22, the plant would stop working long before these levels of contamination were reached. This is because either the expansion valve froze up or because the evaporator fouled up with sludge from the water/oil combination.

Many modern ammonia systems run fully automatically and require virtually no operator intervention, including automatic oil management, air purging and, where necessary, water treatment. The success of oil return systems is due to the use

Cont'd on Page 10

CTTC (Cont'd. from Page 9)

of modern long-life lubricants. Routine oil changes are no longer the norm, and plants can run for many years without a change of oil, provided the oil stays clean and dry. Allowing water to return from the low-pressure side of the system to the compressor may cause expensive bearing damage. If automatic oil return is used, the condition of the oil should be monitored on a regular basis to check for water buildup because there may not be any other sign of water contamination.

Reducing the quantity of ammonia required to achieve the cool-ing load has been a key part of the rehabilitation of ammonia as a refrigerant in public and corporate buildings. It is now relatively common to need no more than 0.75 lbs per ton of cooling capacity in packaged chillers, and some designs achieve even lower figures, down to 0.2 lbs per ton. Equally important is the distribution of ammonia within the chiller. Designs that do not require liquid receivers in the high pressure part of the system are much less likely to cause problems. The benefits of charge minimization have been pursued in Europe since the early 1990s. A growing awareness exists in the North American market that these advantages are relevant there, too.

Following a detailed survey of accident statistics for industrial systems completed in 2007, General Mills introduced a report-ing and tracking system incorporating incident investigation. The system is used to identify root causes of incidents. The company then shares the outcomes from issues common to mul-tiple plants, and addressing those issues across all company facilities. The survey used the Heinrich Principle, to characterize safety-related incidents according to severity. By reducing the base of the Heinrich triangle, the likelihood of accidents can be reduced and, in some cases, they can be eliminated, using charge reduction. In a short course at the International Congress of Refrigeration in Beijing in August 2007 Jeff Welch, current chair of IIAR, identified the goal of charge reduction as being critical to the future of am-monia refrigeration.

Current Applications

In recent years ammonia chillers have been applied to many projects that previously would have used R-11, R-12 or R-22. The city center offices of a major merchant bank in London were equipped with roof-mounted ammonia chillers in 2000. These replaced the existing packaged plant that had proved to be unreliable in hot weather. The investment in equipment paid dividends a few years later in 2003 when record temperatures exceeding 100℉ were exper ienced in the city. A similar installation for the International Maritime Organization in 2001 replaced two R-11 chillers with an equivalent-sized ammonia plant. The building manager reported a significant reduction in energy use once the new system was commissioned.

Similar chillers are used for several ice rinks, with ethylene glycol under the floor. This technology has great scope for further development with the emergence in Europe and Scandinavia of rinks using carbon dioxide as the secondary. Larger chillers, in the range 570 ton to 1,140 ton were deployed for factory cooling, for example by Motorola in Swindon, Roche in Welwyn and Nestlé in York, all in England. These machines use large screw compressors, plate heat exchanger evaporators and plate condensers. The design refrigerant content of 0.75 lbs per ton means the total charge of each of these packages is typically five or six bottles of refrigerant.

High-efficiency chillers using free-cooling features have been used for water chilling in computer data centers during the last 10 years. These systems give an annual average coefficient of system performance of 10 for air-cooled chillers and 13 for evaporative cooled. This suggests one-third of the energy consumption of a typical air-cooled chiller where the heat load is constant all year-round. As the free-cooling effect is achieved by bypassing the compressor in cold weather, no interruption occurs to the chilled water flow and there is only one set of heat rejection exchangers, so the system is highly reliable and compact compared with many other free-cooling solutions.

Large chillers are also used in more densely populated applica-tions without any safety compromises. Four units, each with a cooling capacity of 1,875 ton are installed in the new Terminal 5 at Heathrow, the world's busiest international airport. Ammonia was selected by the airport authority because it was recognized as a future proof solution which offered excellent efficiency but the design choice was only confirmed after a comprehensive risk

Cont'd on Page 11

CTTC (Cont'd. from Page 10)

analysis and safety review had been conducted, which satisfied the design team that there was no greater risk to the public or the airport staff than with a conventional large chiller solution.

Future Applications

The wide acceptance of ammonia chillers in this diverse range of applications has created opportunities for new uses of ammonia equipment in unexpected places. Compared with R-134a, the best of the usual fluorocarbons for heat pump applications, ammonia offers more efficient heat recovery at higher temperatures as a result of its high latent heat and high critical temperature (the maximum temperature at which liquid can condense). This means that heat pump efficiencies with ammonia are significantly better than with fluorocarbons, providing economically feasible opportunities for equipment that would not otherwise be considered. The number of ammonia chillers installed on the roofs of public and office buildings has shown that this technology is safe and reliable, so there is no reason why air-source ammonia heat pumps for water heating could not also be deployed provided the right compressors were available.

Traditional ammonia heat pumps in industrial applications tend to use reciprocating compressors rated for 580 psig discharge pressure. Reciprocating compressors are favored because they run with higher discharge temperatures than screw compressors, but they are less suited to instal-lation on the roof of a modern building, so care would be required in vibration elimination. Both reciprocating and screw compressors have recently been developed for 725 psig operation in carbon dioxide applications. These machines would be an ideal platform for high-pressure am-monia heat pumps, configured as air-source water heaters.

The excellent performance of ammonia heat pumps has also attracted attention for the domestic heat pump market. Several research projects in Europe using ammonia or a mixture of ammonia and dimethyl ether have proved the concept of low charge systems for domestic heating; the major impediment being a lack of suitable components, particularly compressors and control valves.

Ammonia has been widely applied in Europe to supermarket installations using a secondary refrigerant to distribute to the display cases. The secondary in some cases has been propylene glycol, but low viscosity potassium salts have also been used and, of course, carbon dioxide has become the preferred choice for supermarket secondary systems although often with fluo-rocarbon or hydrocarbon refrigerant in the high temperature side of the cascade.

Development Requirements

There is no doubt that compressor developments will offer new possibilities for ammonia systems. Hermetic and semihermetic compressors greatly reduce the risk of leakage and increase system reliability. Although obvious problems exist with copper windings in an ammonia system, several compressor concepts have been tested in recent years. One arrangement is the use of a canned motor, similar to those used in hermetic refrigerant pumps. This has been used for many years, but the efficiency reduction is relatively large and tends to inhibit development of the concept. This is perhaps a mistake, as a canned ammonia compressor still will be significantly more efficient than a tra-ditional semihermetic R-404A compressor across the full range of operation. Another concept is the use of aluminium windings instead of copper. This also brings a slight efficiency penalty. A magnetic drive, similar to those used in some sealless pumps could also be used, although it might be difficult to overcome the starting torque for positive displacement compressors.

At least one manufacturer is already producing hermetic scroll compressors for ammonia. This was incorporated into a prototype water chiller with a cooling capacity of approxi-mately 8.5 ton using a semihermetic can-less motor. A second generation ammonia scroll is under development, and is expected on the market in the second half of 2008.

Another attractive development in compressors would be a variable-speed oil-free compressor similar to those now avail-able for R-134a. Many advantages exist in such a design—no oil management issues in the evaporator, no filter

Cont'd on Page 12

CTTC (Cont'd. from Page 11)

changes or shaft seal, low starting current and low noise/vibration levels. However, this is a large step from the existing technology, and while it is probably technically feasible, a substantial market is needed for these compressors to justify the development cost. Additional factors are the risk of damage by entrained dirt and the proximity of the control electronics to the ammonia system, including the large capacitors in the drive system. This type of compressor is unlikely to receive much funding unless there is a significant move away from fluorinated gases in large chiller systems. In that case, it probably represents the best available technology for providing efficient chillers in the 30 ton to 430 ton range.

Apart from compressors, a need exists for further development in heat exchanger design for ammonia chillers. Microchannel air-cooled condensers offer a significant reduction in refrigerant charge, and it might also be possible to produce a direct expan-sion evaporator for water chilling based upon a shell-and-tube arrangement but with microchannel material for the tubes.

In parallel with these technical developments, a need exists for a comprehensive review of the structure of safety standards to ensure that ammonia equipment is not misapplied, but also that it is not excluded from appropriate, beneficial applica-tions. The high efficiency of ammonia in domestic heat pumps, implemented across the domestic sector in reasonable numbers would produce significant savings in carbon emissions, even when compared to the use of mains gas as the primary fuel, and in the case of replacement of electric heating, the reduc-tion would be more than 75% provided a suitable heat source was available. The charge limits for ammonia systems are based upon industrial IDLH values that assume 30 minutes is required to effect an escape from the affected area. This is reasonable for equipment installed in a large industrial com-plex, but it seems excessive in the domestic context, given the self-alarming smell associated with an ammonia leak.

It is important to recognize that ammonia is different than many other refrigerants in this respect because it is not possible to be exposed to a damaging concentration of ammonia and not be aware of its presence. Even for people with no sense of smell, they will experience characteristic signs of eye and throat irritation at levels far lower than the toxic limit, prompting the affected person to leave the area to seek relief in fresh air.

It seems reasonable to allow larger quantities of ammonia to be used in systems for domestic and commercial heat pumps and other appliances provided the unit is not installed in an area where people are restricted in their movements, for example, certain areas within hospitals, schools or prisons. Other types of water heaters are not installed in these areas either. They are located in a utility room. Therefore, this limitation would not significantly restrict the market potential for the new equipment.

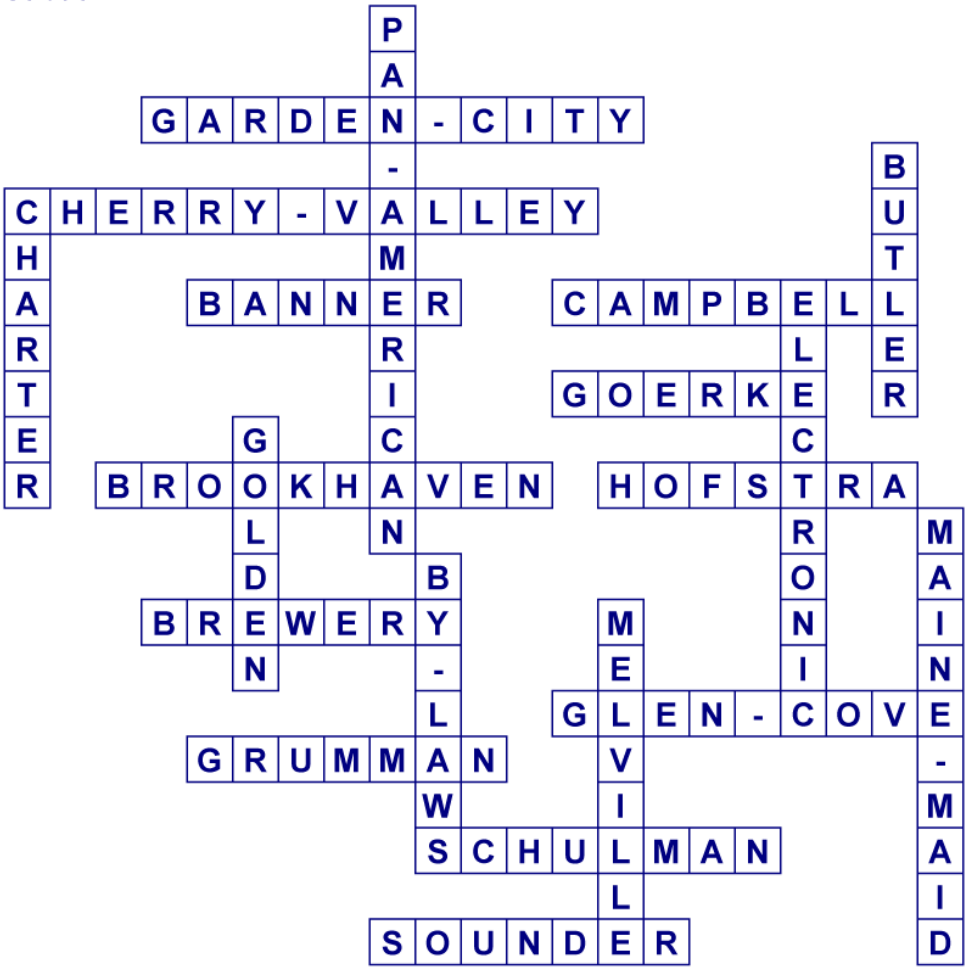
Conclusions

Ammonia has been accepted in many new applications without significant overall additional cost, and without any compromise in occupant safety. This has been achieved by the adoption of a range of new technologies, materials and techniques. Further development in these areas present many opportunities to gain energy savings, and these opportunities should not be ignored. A coordinated approach to technical, commercial and legisla-tive development is necessary. It is correct to include a detailed review of legislation and standards in the development exercise because the principles on which the codes and standards are based were laid down more than 50 years ago, and technology has changed beyond recognition since then.

Andrew Manos
Chapter Technologies Transfer Committee Chair

History - The History Challenge (Crossword Puzzle Answers—Cont'd from Pg 7)

Solution:



ASHRAE REGION 1 EXECUTIVE COMMITTEE 2008-2009

DRC - DIRECTOR & REGIONAL CHAIR Garry N. Myers Flack + Kurtz Inc. 73 Bonnie Way Allendale, NJ 07401 Phone:(B) 212-951-2815 Email: Garry.Myersny@fk.com	**ARC - ASSISTANT REGIONAL CHAIR & TREASURER** Spencer Morasch Jersey Central Power & Light 331 Newman Springs Road Red Bank, NJ 07701 Phone:(B) 732-212-4133 Email: smorasch@firstenergycorp.com
NOMINATING COMMITTEE MEMBER Emery Otruba, P.E. 262 Johnson Hill Rd Hoosick Falls, NY 12090 Phone: 518.686.4436 Email: eotruba@verizon.net	**NOMINATING COMMITTEE ALTERNATE** Cliff Konitz 4 Dennis Road Wappingers Falls, NY 12590 Phone:(H) 845-297-5864 Email: c.konitz@verizon.net
RVC MEMBERSHIP PROMOTION Joseph Furman Belimo Americas 43 Old Ridgebury Road Danbury, CT 06810 Phone:(B) (203) 749-3163 Email: joe.furman@us.belimo.com	**RVC RESEARCH PROMOTION** Ron Swarthout 921 Forest Road Endwell, NY 13790 Phone: (607)-754-7590 Email: rwswarthou@cs.com
RVC CHAPTER TECHNOLOGY TRANSFER Lee Loomis Center for Environmental Information 55 St. Paul St. Rochester, New York 14604 Phone: (C) (585) 738-3079 Email: leeloom@aol.com	**RVC STUDENT ACTIVITIES** Richard Vehlow NYS Office of General Services 33rd floor Corning Tower GNARESP Albany, NY 12242 W: 518-486-1510 Email: Rev1969@gmail.com
REGIONAL CHAPTER PROGRAMS Peter Oppelt R.F. Peck Co. 889 Atlantic Ave. Rochester, NY 14609 Phone:(B) 585-697-0836 x103 Email: poppelt@rfpeck.com	**REGIONAL REFRIGERATION CHAIR** (Position Vacant)
REGIONAL HISTORIAN Phil Knowlton Knowlton Associates 191 Middle Haddam Road Portland, CT 06480 Phone: (B) 860-642-3970 pbknowlton@comcast.net	**REGIONAL ELECTRONICS COMMUNICATION CHAIR, & NEWSLETTER JUDGE** Heather L. Nowakowski, P.E. Roswell Park Cancer Institute Elm & Carlton Streets Buffalo, NY 14263 Phone: (B) 716-845-8144 Email: Heather.nowakowski@roswellpark.org
DIRECTOR OF MEMBER SERVICES Carolyn Kettering ASHRAE 1791 Tullie Circle, N.E. Atlanta, GA 30329 Phone: (B) 404-636-8400 Email: ckettering@ashrae.org	**DIRECTOR OF COMMUNICATIONS AND PUBLICATIONS** Jodi Dunlop ASHRAE 1791 Tullie Circle, N.E. Atlanta, GA 30329 Phone: (B) 404-636-8400 Email: jdunlop@ashrae.org

ASHRAE REGION 1 CHAPTER PRESIDENTS 2008-2009

BI-STATE Terry Connor 3 Westchester Plaza Elmsford, NY 10523 Trane Phone: 914-593-0303 x 101 tpconnor@trane.com	**BOSTON** Jeffrey Schultz 25 Emily Rd. Framingham, MA 10701 BR+A Consulting Engineers Phone: 617-925-8242 jhs@brplusa.com
CHAMPLAIN VALLEY Heather Condon 255 S. Champlain Street, Ste 7 Burlington, VT 05401 Vt. Energy Investment Corp. Phone: 800-639-6069 x1052 hcondon@veic.org	**CENTRAL NY** Chris Martin 5 Technology Plaza Syracuse, NY 13221 Carrier Corporation Phone: 315-463-4526 Chris.martin@carrier.utc.com
CONNECTICUT Matthew Mullen 166 Tunnel Rd. Vernon, CT 06066 EMCOR Services Phone: 860-870-2250 mullen@nemsi.com	**GRANITE STATE** Don Carrington 4 Hardwick Rd Petersham, MA 01366 Phone: 603-540-2888 dcarrington@cr-bas.com
LONG ISLAND Steven Friedman, HFDP 450 West Broadway, Unit 3D Long Beach, NY 11561 Lilker Associates Phone: 212-695-1000 sfriedman@lilker.com	**MAINE** Steve Martel, P.E. 12 River Meadow Drive Steep Falls, ME 04085 Investment Engineering Phone: 207-642-3940 smartel46@roadrunner.com
NORTHEAST William Gerstler One Research Circle Niskayuna, NY 12309 GE R&D Phone: 518-387-6235 Gerstler@crd.ge.com	**NIAGARA FRONTIER** Randy Corsi 9250 Transit Rd. East Amherst, NY 14051 R.P. Fedder Phone: 716-689-4933 randy@rpfedder.com
NEW JERSEY Mark Richter 1501 Broadway, Suite 700 New York, NY 10036 AKF Engineers Phone: 212-354-5656 mrichter@akf-eng.com	**NEW YORK** Om Taneja, P.E. 26 Federal Plaza New York, NY 10278 U.S. GSA Phone: 212-264-4465 Om.taneja@gsa.gov
RHODE ISLAND Bill Ricci North Providence, RI 02904 Lamar & Sons Phone: 401-349-5430 billricci@lamar-and-sons.com	**ROCHESTER** Joe Van Cura 740 Driving Park Ave. Rochester, NY 14613 R.P. Fedder Corp Phone: 585-288-1600 x110 jvc@rpfedder.com
TWIN TIERS James F. Green 1701 North Street Endicott, NY 13760 Stantec Phone: 607-755-9800 jgreen3@stny.rr.com	

ADVERTISEMENTS

ADVERTISEMENTS

If you would like to place an advertisement in The Long Island Sounder please contact our Chapter Treasurer, Mr. Brian Simkins @ 203.261.8100 or via email bsimkins@accuspecinc.com for further details. Thank you.

New Advertising Rates:

Business Card	***$200***
Triple Size	***$350***
Half Page	***$500***
Full Page	***$800***