

Florida West Coast Chapter
ASHRAE
3203 Queen Palm Drive
Tampa, Florida 33619



Keeping it Cool with ASHRAE



Special points of interest:

- > The next FWC Meeting of the year will be Tuesday, March the 15th at The Columbia.
- > ASHRAE Golf Tournament on February 18th!



From the Desk of the President

In case you didn't know, I'm a big fan of beer. "Beer good" as Homer Simpson would say. Recently while lying in bed enjoying the fruits of my beer drinking efforts, a show came on TV about, you guessed it, beer. I had no idea how much the brewing industry had in common with HVAC. The announcer on the show said something about the vapor compression cycle and my ears perked up. What? Beer and refrigeration in the same show? Have I died? I had to pinch myself.

Carl Paul Gottfried von Linde was born in June of 1842. He was the son of a German (if you couldn't tell) minister. In 1861 he started taking engineering courses at the [Swiss Federal Institute of Technology in Zürich, Switzerland](#). In early 1864 he graduated with a degree in mechanical engineering. Apparently you could get an engineering degree in three years back then. Either he was real smart or they didn't have to take differential equations back then. Anyway, he spent several years working in the locomotive industry and then took a job at a new college called [Technische Hochschule](#). Here he became a full professor of mechanical engineering and set up an engineering lab where he taught students such as Rudolph Diesel.

In the 1870's he started to publish articles describing his research findings in the area of refrigeration. Soon after that he started building refrigeration plants that were commercially successful. His new refrigeration technology was of particular interest to German breweries. By 1890 he had built and sold 747 refrigeration machines across the country. In 1892 an order from the Guinness brewery.....ahhh.....Guinness.....for a carbon dioxide liquefaction machine drove Linde's research in to the realm of low temperature refrigeration. In 1895 he found success and filed for a patent. His research went on to discover methods to liquefy air which allowed him to learn methods to obtain pure oxygen and nitrogen. This led to other inventions such as the oxyacetylene torch which allowed the construction industry to grow with new metal cutting and welding methods.

His first refrigeration machines used dimethyl ether as a refrigerant. I tried looking up what the global warming potential or flammability ratings were for this refrigerant but I was unsuccessful. Needless to say, by the name alone, I'm sure the EPA would have a field day with it. His first machine was installed in the Spaten brewery.....ahhhh.....Spaten.....in 1873. Later he developed more reliable machines using ammonia.

Now that the history lesson is over, let me mention that on February 18th we are having our annual FWC Golf Tournament at The Eagles Golf Course again. Be sure to get your team in quickly as spots are filling up fast. I hope to see you all there.

Jeff Ross, FWC President (2010-2011)

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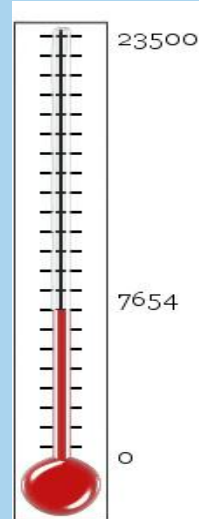
Research Promotion

Let me start by personally thanking each and every investor both individual and corporate, it is because of you that the Florida West Coast Chapter continues to set the standard and lead the way, not only in Region XII but on a national level. As of December 31, 2010 the Florida West Coast Chapter has collected over \$ 7,654.00, please be sure to recognize those investors that are listed in this newsletter.

Please make your contributions early this year either by check 'Payable to ASHRAE Research' and turn them in to me or if you prefer you can make online donations at https://www.ashrae.org/aboutus/resource_promotion.asp .

If you make a donation online, please forward me a copy of the emailed invoice so I can ensure that proper credit is given at jason@vickerycompany.com.

Jason Proctor
FWC Membership Chair
(2010-2011)



Membership Promotion

Membership Advancement: Why me, because you have earned your advancement. Greetings from your Florida West Coast Chapter of ASHRAE. In talking to several members, they were unaware that they could advance to the level of member from associate or from student member to associate. A few didn't realize that there were different grades which I take on as a failure on my part for not bringing this in front of the greatest chapter on this green earth. Here is the breakdown of a few of the grades in ASHRAE with a brief description of your benefits:

Life Member/Life Associate Member

Be in Good standing and a member or associate member for 30 years or greater and 65 years old.

Rights and privileges of most recent membership grade

Member

At the time of admission or advancement, a Member shall have the equivalent of 12 Society-approved years of experience composed of an approved combination of: (1) completed education beyond high school; (2) work experience*; and (3) professional engineering or related registration or license issued by a legally authorized body. *Qualifying work experience must be in the performance of duties in work related to ASHRAE fields and shall have included research, teaching, design, contracting, engineering sales, or engineering management.

Members have voting privileges; receive the ASHRAE Journal, Insights, ASHRAE handbook and the eNewsletters; Access to the Members only website; discounts on ASHRAE products and services; and access to group insurance.

Associate

An Associate Member shall have had experience in technical matters or in design, operation, or maintenance in HVAC&R fields; shall have an interest in the advancement of the Society's aims, and shall possess sufficient qualifications to cooperate with HVAC&R engineers in the advancement of the knowledge relating to HVAC&R engineering and its application.

Associate Members have voting privileges; receive the ASHRAE Journal, Insights, ASHRAE handbook and the eNewsletters; Access to the Members only website; discounts on ASHRAE products and services; and Group insurance.

Affiliate

An Affiliate Member shall have had HVAC&R experience; Interest in Society's goals; must be a new member (cannot have ever held Student Member status).

This is an introductory membership into ASHRAE that automatically graduates to Associate Member after 3 years.

If you have any questions regarding your membership, please contact me at your earliest convenience. You can contact me at pjean@stanweaver.com or call Stan Weaver and Company at 813-879-0383. If I am not available ask for Jackie Johnson or Stan Weaver.

ASHRAE Research—Improving US Army Facilities

ASHRAE leaders recently met with U.S. Army officials regarding a new sustainable design and development policy that incorporates requirements of the green building standard developed by the Society, USGBC and IES.

The U.S. Army has made it a matter of policy to promote sustainability and improve green building standards for its facilities. On October 27, 2010, Katherine Hammack, assistant secretary of the Army for installations, energy and the environment (IE&E), issued a policy memorandum that incorporates ANSI/ASHRAE/USGBC/IES Standard 189.1-2009, *Standard for Design of High-Performance, Green Buildings Except Low-Rise Residential Buildings*.

The Army's policy sets a new approach to the design and construction of efficient military construction projects and major renovations by using Standard 189.1 as the baseline. The policy requires that facility construction projects follow specified requirements and guidance in the standard. These requirements address sizing, energy efficiency, cool roofs, metering, storm water management and indoor and outdoor water consumption.

"After nearly four years of peer review and collaboration with various members of industry, we are extremely pleased that the Army has taken up the initiative to incorporate the standard into its day-to-day practices," Lynn G. Bellenger, ASHRAE president, said. "The Army is clearly committed to taking the lead within the military to incorporate innovative practices proven by the private sector. The willingness to adopt this standard speaks volumes about its value and efficacy."

The net effect of the Army's sustainable design initiative is likely to be immense. The policy applies to all construction and renovation of new buildings and structures in the U.S. territories, permanent overseas Active Army installations, Army Reserve Centers, Army National Guard facilities and Armed Forces Reserve Centers. The footprint of the existing Army buildings and structures worldwide covers more than 954 million square feet.

"We are committed to sustainable design and development but our commitment extends far beyond construction and renovation savings," Hammack said. "We are on a path to integrating energy and sustainability consideration into our fundamental way of thinking as we progress toward net-zero energy, water and waste in buildings and installations."

ASHRAE leadership and Army officials discussed how the Society could continue development and stringency of Standard 189.1 to provide guidance toward net-zero buildings. Additionally discussed were how ASHRAE can help fulfill the Army's training needs regarding the standard and how 189.1 fits in to the Army's long-term plans to make their facilities more sustainable.

Standard 189.1, published earlier this year by ASHRAE in conjunction with the Illuminating Engineering Society of North America (IES) and the U.S. Green Building Council (USGBC), provides a long-needed green building foundation for those who strive to design, build and operate green buildings.

Message to Donors and Non-Donors

We need your support to fund the research of tomorrow TODAY! Please continue to support ASHRAE Research through your Dues and Chapter events. For more information on Research and what is being done to improve the world around us please visit us on the web [HERE](#).

Help us fund the research of tomorrow TODAY! Please make your contributions early this year either by check 'Payable to ASHRAE Research' and turn them in to me or if you prefer you can make online donations at https://www.ashrae.org/aboutus/resource_promotion.asp.

If you are an ASHRAE Member or work in the HVAC&R industry you utilize and benefit from ASHRAE Research everyday. Not to mention the projects that are improving your day-to-day life through better indoor air quality and longer shelf life of produce, just to name a few.

Please consider supporting the research that works so hard for you. And your help is definitely needed! According to the *Potential Projects for Bid in Spring 2011* report, there are 23 projects currently awaiting the availability of ASHRAE funds. The value of these projects is approximately \$3.5 million.

Contributing to ASHRAE Research is easy – give with your annual Dues, give at a Chapter meeting, give at a Chapter special event, give online [HERE](#), or send your contribution directly to ASHRAE Headquarters:

ASHRAE Research, 1791 Tullie Circle, NE Atlanta, GA 30329

Duct Fitting Database Latest ASHRAE Resource to Become Mobile App

ATLANTA –ASHRAE’s popular Duct Fitting Database desktop application has become even more valuable as a smart phone app, allowing engineers to make complicated calculations in the field and receive faster results.

Developed for Apple’s iPhone, iPod touch and iPad, the ASHRAE Duct Fitting Database (DFDB) app allows users to perform pressure loss calculations for more than 200 HVAC duct fittings in both I-P and SI units.

This new application ensures that engineers in the field have instant access to the most accurate information without having to return to their office to perform calculations. The mobile app features dynamic illustrations of each design, allows for easy use on the job to do quick duct pressure loss calculations and the inputs can be adjusted by touch and installation is automatic.

Other special features of the DFDB app are as follows:

- Users can create individual projects, each with unique input values and results.
- Each fitting has its own custom set of input parameters and results.
- Users can easily change the minimum and maximum allowable values for all input parameters.
- Users can display and email two types of reports, which include a spreadsheet attachment that can be opened on a desktop computer to do further analysis.

The DFDB app is the second mobile app to be released by ASHRAE. The Society published the 62.1 app in the winter of 2010.

The ASHRAE DFDB app can be purchased through Apple’s online iPhone App Store for \$19.99. This initial release of the ASHRAE DFDB app includes supply and common round fittings only, though subsequent versions including all of the remaining fittings will be released monthly. Those who purchase the app now will receive these updates as free upgrades.

This app was developed for ASHRAE by Carmel Software Corp., a firm specializing in the development of engineering and scientific mobile and tablet software applications.

ASHRAE is an international technical society that fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.



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Standard 90.1-2007 Available as Free Download

ATLANTA –In order to move the industry forward toward more energy efficient design, ASHRAE is making it easier than ever before to access its flagship energy standard, 90.1, available as a free download for a limited time.

Through a funding contract with the Department of Energy, copies of the I-P edition of ANSI/ASHRAE/IES Standard 90.1-2007, Energy Standard for Buildings Except Low-Rise Residential Buildings, are being offered as a free downloadable PDF at www.ashrae.org/standard901-2007-free, starting Oct. 22, 2010.

“Standard 90.1-2007 is widely used throughout the design community, and the download version makes it available to users at their own computers for ready and easy access,” ASHRAE President Lynn G. Bellenger said. “Making the standard available for free ensures that it penetrates the marketplace and reaches owners, contractors and design teams. We appreciate the support of the Department of Energy in reaching a wider audience and extending access to our flagship energy conservation standard.”

Since being developed in response to the energy crisis in the 1970s, Standard 90.1 has become the basis for building codes, and the standard for building design and construction throughout the United States.

As buildings consume approximately 40 percent of the primary energy in the United States, the standard is an indispensable reference for engineers and other professionals involved in the design of buildings and building systems.

ASHRAE is an international technical society that fulfills its mission of advancing heating, ventilation, air conditioning and refrigeration to serve humanity and promote a sustainable world through research, standards writing, publishing and continuing education.

ASHRAE FWC Golf Tournament

Don't Forget About the ASHRAE Florida West Coast Gold Tournament This Friday:

Location: The Eagles Golf Club of Tampa Bay
 Forest Course
 16101 Nine Eagles Dr.
 Odessa, FL 33556
 Ph# 813.920.6681

Special ContestsLongest Drive hole, Closest to the Pin hole, and Putting Contest

Schedule: 10:30am.....Registration Begins, Practice at the Range, Receive bag lunch
 12:30pmShotgun Start of Golf Tournament (4-person Scramble format)
 5:30pmReception and Awards Dinner (approximate time)



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Past Presidents

1957-58 Karl K. Hickman	1984-85 Charles E. Langbein
1958-59 Sam F. Graziano	1985-86 Thomas H. Williams
1959-60 Julian Johnson	1986-87 Caire A. Boe
1960-61 Ken Whittington	1987-88 Frank Grandinetti
1961-62 Mark E. Mooney	1988-89 Carl B. Lawson
1962-63 James A. Hargan	1989-90 Robert M. Little
1963-64 Daniel R. Manrique	1990-91 Edward C. Spivey
1964-65 E. J. Bauerlien	1991-92 Robert P. Sutton
1965-66 Henry Graham	1992-93 Roger B. Redman
1966-67 Richard Kohle	1993-94 Stephen A. Chittenden
1967-68 Lamar King/Leland B. Menard	1994-95 William M. Slade
1968-69 Ed Fuller	1995-96 Juan A. Soler
1969-70 William A. Smith	1996-97 Timothy J. Citek
1970-71 Fareed T. Ossi	1997-98 Mark Smith
1971-72 Lee Bendall	1998-99 Joseph Griner, III
1972-73 John Degian	1999-00 Colleen Smith
1973-74 Mark Chambers	2000-01 John W. Wells, III
1974-75 Charles "Stan" Weaver	2001-02 Gary Stenlund
1975-76 Charles D. Jacobs	2002-03 Bill Wright
1976-77 Peter Scott	2003-04 Don Crosby
1977-78 Ray Rinke	2004-05 Ted S. Hansen, Sr.
1978-79 Lloyd H. Biossoneault	2005-2006 P.J. Crespo
1979-80 James H. Carroll, Jr.	2006-2007 Dan Herrera
1980-81 S. Michael Tappouni	2007-2008 Jennifer Isenbeck
1981-82 Alberto J. Sanchez	2008-2009 Debie Horsey
1982-83 James L. Repp	2009-2010 Drew Elsberry
1983-84 Rodney C. Thomas	

TEGA Update

Well, another year has come and gone, and we're half way through another ASHRAE year... how time flies when you're having fun!

It has been a while since the FWC has entered a project in the regional technology award competition, and the chapter would like to recognize the work of our engineering community by submitting a project for the 2010-2011 competition. The regional competition submission is very easy and it is not a time consuming endeavor; give me a call if you need further info. Anyone care to make a run for the Gold? Speaking of Gold...

GSA Moves to LEED Gold Standard for All New Federal Buildings

According to a recent DOE press release (<http://bit.ly/cFi2o5>), the U.S. General Services Administration (GSA) is upgrading the requirement for new federal building construction from LEED Silver to LEED Gold certification. The new requirement will also apply to substantial renovation projects. GSA announced on October 28 that the higher rating would be reflected in GSA's Facilities Standards for the Public Buildings Service by the end of calendar year 2010. GSA uses the Leadership in Energy and Environmental Design, or "LEED", Green Building Rating System of the U.S. Green Building Council to evaluate and measure achievements in sustainable design. For projects funded prior to FY 2010 that are now being designed, GSA is requiring that LEED Gold prerequisites and other specific requirements be incorporated into ongoing designs whenever possible after considering budget and schedule constraints.

Make sure to keep those government contact emails coming in!

Joe Souza, TEGA Chair (2010-2011)

Your Florida West Coast Chapter website has been updated and is looking for more content! Is there information you would like to see made available online? Do you have questions about the Florida West Coast Chapter? Let us know! Feel free to email your Cyber Chair, [Jason Babinec](mailto:Jason.Babinec) with any concerns or comments.

This home page is maintained by the Florida West Coast Chapter of the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. ASHRAE chapters may not act for the Society and the information presented here has not had Society review. To learn more about ASHRAE activities on an international level, contact the ASHRAE home page at <http://www.ashrae.org>.

Board Members, Committee Chairs and Contact Info:

<u>Jeff Ross</u> President 813-918-8252	<u>Shawn Jeffrey</u> Pres. Elect/Programs 813-731-1062	<u>Jason Proctor</u> V.P./Research Promotion 813-917-1648	<u>Philippe Jean</u> Membership/Education 813-541-3516	<u>Joe Souza</u> Treasurer/TEGA 813-309-2155	<u>Joe Cox</u> Secretary/Student Chair 813-763-9654
<u>Debie Horsey</u> YEA Chair 813-97748-9406	<u>Dan Herrera</u> Historian 813-839-0506	<u>David Henry</u> Governor 813-310-8977	<u>Adam Parke</u> Refrigeration 813-228-1755	<u>Mike Costello</u> Publicity/Governor 813-300-4662	<u>Michael Cowles</u> Newsletter/Governor 813-241-6488
<u>Drew Elsberry</u> Nominating/Governor 813-267-0973	<u>Ike Crimm</u> Special Events 813-758-2749	<u>Leon Boe</u> Reception 813-879-0383	<u>Jason Babinec</u> Cyber Chair 863-581-6967	<u>Jason Proctor</u> Chapter Roster 813-917-1648	<u>Ike Crimm</u> Nominations/Governor 813-635-2271

Thank You to the following who have made their contributions already:

Florida West Coast Chapter Research Promotion Contributors for 2010-2011

Bronze (\$500-\$999):

**Advanced Automation Systems
Air Mechanical & Service Corporation
Dan Rogers**

Antique (\$250-\$499):

**Original Solutions
Consulting Engineering Associates
Slade Ross
Shawn Jeffrey
Commercial Products Corporation
Stan Weaver & Company**

Honor Roll (\$150-\$249):

**Vickery & Company
Luvata Electrofin
Southern Independent Testing**

Individual Honor Roll – Investors (\$100-\$249):

Al Sanchez	Murray Woodgate
Joe Souza	Jason Proctor
Raoul Webb	Joe Cox
Jeffrey Ross	Phillippe Jean
Carl Lawson	John B Siegenthaler
Thomas H Williams	Robert J Barstow
John Siegenthaler	Adam Parke
Andrew Elsberry	Ross Montgomery
Debie Horsey	PJ Crespo

Young Engineers in ASHRAE (YEA) Social



FWC ASHRAE is calling all Kingpins and Alley Cats to join us for the Young Engineers in ASHRAE social at the AMF Bowling Center up by USF. This event is hosted by the Florida West Coast Chapter of ASHRAE. Young Engineers in ASHRAE (YEA) is a subcommittee of ASHRAE created for members age 35 and under, however all ages are welcome to attend!



Last Year's YEA event ↑

Date: Wednesday, February 23, 2011

Time: 6:30pm – 10:30pm

Bowling from 6:30pm-8:30pm

Pool from 8:30pm-10:30pm

\$20/person

USF Students—FREE!!!



AMF BOWLING CENTER

13109 North 56th Street
Tampa, FL 33617

ASHRAE Membership not required to participate. **EVERYONE** is welcome!

R.S.V.P. to *Debie Horsey*: dhorsey@carrollair.com

(813)879-5790 x2231



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**ASHRAE - Florida West Coast Chapter
Annual Golf Tournament**
Friday, February 18th 2011 @ 12:30pm

Sponsorship Levels:

- \$625.00 **Gold Team Sponsor** save \$50
Includes: 4-some Golf Team + Golf Pin Flag (1) + Tee Box Sign (1)
- \$525.00 **Silver Team Sponsor** save \$25
Includes: 4-some Golf Team + Golf Pin Flag (1)
- \$500.00 **Bronze Team Sponsor** save \$25
Includes: 4-some Golf Team + Tee Box Sign (1)
- \$800.00 **Event Shirt Sponsor...SOLD**
Company name/logo embroidered on sleeve of polo shirt given to each golfer & volunteer
- \$300.00 **Tote Gift Bag Sponsor...SOLD**
Company name/logo recognition on Tote Gift Bag given to all Golfers
- \$250.00 **Putting Contest Sponsor**
Company name/logo recognition on signage at Putting Contest
- \$150.00 **Longest Drive Sponsor**
Company name/logo recognition on signage at hole
- \$150.00 **Closest to the Pin Sponsor**
Company name/logo recognition on signage at hole
- \$150.00 **Golf Pin Flag Sponsor**
Company logo featured on weatherproof Pin Flag placed at hole on course / returned to sponsor after event
- \$125.00 **Tee Sponsor**
Company name/logo featured on a sign prominently displayed at a Tee Box
- \$100.00 **Individual Golfer**
Includes: Bag Lunch, Practice @ Range, Polo Shirt, Gift Bag, Golf & Cart Fee, and Awards Dinner

Donations of your company's logo items are also welcome for inclusion in the participant Gift Bag or as Raffle Prizes

Location: The Eagles Golf Club of Tampa Bay
Forest Course
16101 Nine Eagles Dr.
Odessa, FL 33556
Ph# 813.920.6681



Special Contests Longest Drive hole, Closest to the Pin hole, and Putting Contest

Schedule: 10:30am Registration Begins, Practice at the Range, Receive bag lunch
12:30pm Shotgun Start of Golf Tournament (4-person Scramble format)
5:30pm Reception and Awards Dinner (approximate time)

Registration Information / online @ www.ASHRAE-FWC.org *All Payments Required Prior to Day of Event*

Corporation /Name: _____	Golf Entrant 1: _____	Shirt Size: _____
Contact and Title: _____	Golf Entrant 2: _____	Shirt Size: _____
Mailing Address: _____	Golf Entrant 3: _____	Shirt Size: _____
City/State/Zip: _____	Golf Entrant 4: _____	Shirt Size: _____
Phone: _____		
Email Address: _____		

Sponsorship

Type/Level: _____ Qty: _____ Fee: \$ _____
 Type/Level: _____ Qty: _____ Fee: \$ _____
 Total Fees: \$ _____

Submit JPEG/Vector file LOGO by January 28th, 2010 to: jsaacrimm@engineer.com

Payment Information:

Use PayPal online at: <http://www.ashrae-fwc.org/golftournament.htm>
 OR...make checks payable to ASHRAE-FWC and mail to the following address:
 ASHRAE-FWC Golf Tournament C/O Isaac Crimm
 1511 N. Westshore Blvd., Suite #820
 Tampa, FL 33607
 For more information please email questions to: jsaacrimm@engineer.com



 ASHRAE Technology Awards

Show the World You Made It



So why haven't you entered?

Be the winner of the industry's most prestigious honor for efficient use of energy in building and environmental system performance.

The ASHRAE Technology Awards recognize, on a global scale, successful applications of innovative design, which incorporate ASHRAE standards for effective energy management, indoor air quality, and mechanical design.

Awards are given annually in the following categories:

- Commercial buildings
- Industrial facilities
- Health care facilities
- Residential
- Public assembly
- Alternative or renewable energy use
- Institutional buildings

ASHRAE would like to recognize our 2009 first place winners:

- **Kenneth Sonmor**—St. Laurent Office Tower/Montreal, Canada
- **Laurier Nicols**—Centre Communautaire de Mississini/Misstissini, Quebec, Canada
- **Thomas Durkin**—HVAC Renovations at George Washington Carver Elementary School Indianapolis, Indiana
- **Jacques de Grace**—Normand-Maurice Building/Montreal, Quebec, Canada



For forms, information and deadlines visit www.ashrae.org/technologyawards

Contact your CTTC RVC or R. Douglas at ASHRAE headquarters

Phone: 678.539.1128 | **Email:** rdouglas@ashrae.org

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



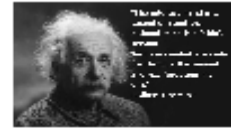
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American Society of Heating, Refrigerating and Air-Conditioning Engineers



Sarasota-Bradenton Section

Mentoring Minds Meeting Notice
 Wednesday February 16, 2011



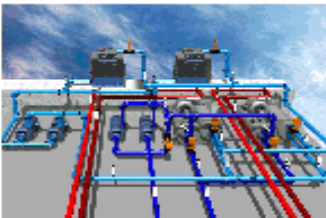
Fundamentals of Chilled Water Plant Design

The Sarasota-Bradenton section is proud to announce the fourth installment of a program series designed to help give back to the engineering community by teaching core fundamentals of our trade. One of ASHRAE's core commitments is as follows:

"We are committed to the advancement of the arts and sciences of HVAC&R for the benefit of society through research, technology development and transfer, and education and training".

This series of programs is designed to help provide a basic understanding of HVAC engineering! Tonight's topic is going to cover the fundamentals of Chilled Water Plant Design! The evening will cover the following:

- **Chilled water Plant Analysis fundamentals**
 - o Understanding the load model
 - o System type Analysis
 - Air Cooled vs. Water cooled
 - Primary/Secondary vs. Variable flow primary
 - **Chiller Scheme Evaluations**
 - o Constant Volume Pumping
 - o Constant Volume By-pass Pumping
 - o Primary/Secondary Pumping
 - o Variable Flow Primary Pumping
 - o Thermal Storage
- **Pumping Evaluations**
 - o How to evaluate the pumps
 - o Displacement Ventilation



Mentor for the Evening
 Al LaPera CxA, LEED™ AP BD+C
 TLC Engineering for Architecture

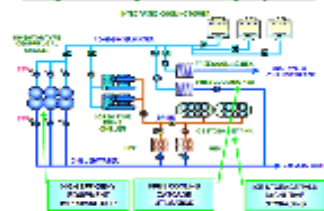
Trane Parts Store
 2224 72nd Terrace East
 Sarasota, FL 34243

Class Starts: 6:30PM

Cost \$10

Meal choices are as follows:
 Pizza, Pizza, Pizza and a drink!

Integrated High Efficiency System*



Need RSVP no later than Monday 2/14/10 to
scott@indooreenvironmentaltesting.com

Note: If you attended previous classes, please bring your binder

