

October-November 2013 edition

Volume 2, Issue 2

## UPCOMING CHAPTER EVENTS

**DINNER MTG—Nov 12th**

**Membership and Honoring the Past Presidents**

4:30–5:15 PM BOG Meeting  
5:30 - 6:00 PM Sign In/Networking  
6:00 - 6:15 PM Dinner/Announcements  
6:15 - 7:30 PM Program

### General Meeting

### DINNER/LUNCH COST

Members - \$30/\$35 after RSVP deadline  
Non-Members - \$40  
Student/Lifetime Members- Free

### RESERVATIONS

If you are planning to attend one of the Chapter Meetings, please RSVP at least four (4) business days before the meeting. RSVP via the Chapter's website or email at central.az.ashrae@gmail.com.

### LOCATION

Radisson Hotel  
427 N 44th Street  
Phoenix, AZ 85008

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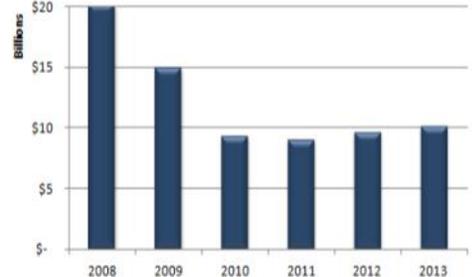
## Did You Know:

The light at the end of the tunnel is no longer the freight train headed our way on a collision course, but it is truly the light at the end of the dark tunnel we all have been enduring for the 'great recession'. I wanted to share with you what the numbers looked like for the past few years. As you can see we are finally turning to the uphill swing!

The chart to the right comes from the Arizona Builder's Exchange. The AZBEX explains the activity as follows, "With an excellent fourth quarter for Fiscal 2013, construction volume topped \$10B for the year ending June 30. Fourth quarter sales were up 12 percent over 2012. The boost in activity during the quarter brought annual volume up 5.8 percent over last fiscal year's \$9.5B.

1 The \$10B for 2013 marks the  
2 first time in four years con-  
3 tracting sales topped \$10B.  
4 However, last year's sales  
5 were less than half the \$20.2B  
7 reported in fiscal 2008. Big  
jumps in housing construction  
and major projects breaking  
ground this summer

Contractor Activity By Fiscal Year



contributed to the jump."

So, we are hopefully through some of the most interesting economic times. As we drive around town, we see fewer for sale and for lease signs in front of commercial building—progress. We have a ways to go for the activity we have seen in 2008, but those days will



## Gone But Not Forgotten

Bill Haggard died October 21st at the age of 88. He was not only the President of our ASHRAE Chapter in 1971, but also served as President for ACCA, SMACNA and the Electric League of Arizona. He was truly an individual that gave back to the industry during his 50 year career in the Valley. Bill's family moved to Phoenix in 1940 where he attended Phoenix Union High School. Like so many of his age, Bill served in WW II in the South Pacific in the US Navy Submarine force. Bill was a true patriot and a force in our industry.





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	Exhibit Hall	Conference
Nov. 6:	10:00am – 3:00pm	8:25am – 3:00pm
Nov. 7:	10:00am – 2:00pm	8:25am – 3:00pm

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For exhibiting information contact George Runckel at 800-827-8009 x4405, [george.runckel@cygnus.com](mailto:george.runckel@cygnus.com) or Joyce Lortz at 800-827-8009 x4424, [joyce.lortz@cygnus.com](mailto:joyce.lortz@cygnus.com)



# Chapter Events Calendar for 2013-2014



The ASHRAE Central Arizona Chapter holds monthly meetings from September to May. Unless indicated otherwise, Chapter Meetings are held in the Grand Canyon Room of the Radisson Hotel Phoenix Airport North, located at 427 North 44th Street in Phoenix. Free parking is available.

Meeting Date	Location	General Meeting Topic	Time	Notes	Time
9/10/13	Radisson Hotel	Fan Sound Issues & FEG & DOE Update	6:00 PM		
10/8/13	Radisson Hotel	Underfloor	6:00 PM		
11/9/13	Casa Grande	Trap Shoot Classic	1:30 PM	8015 S Ison Rd, Casa Grande	
11/12/13	Radisson Hotel	Membership Dinner Meeting	6:00 PM	Past Presidents' Night	
12/10/13	Radisson Hotel	Lunch Meeting	11:30 AM		
12/12/13	Sun Up brewery	Holiday Social	4-8:00 PM		
1/14/14	Radisson Hotel	Dinner Meeting	6:00 PM		
2/11/14	Radisson Hotel	Lunch Meeting	11:30 AM		
2/20/14	El Zaribah Shrine Auditorium	ASHRAE/ASPE Chapter Product Show	2:00 PM		
3/11/14	Radisson Hotel	Dinner Meeting	6:00 PM		
4/8/14	Radisson Hotel	Dinner Meeting	6:00 PM		
4/11/14	TBD	Annual Golf Tournament Shotgun Start	TBD		
5/13/2014	Radisson Hotel	Dinner Meeting	6:00 PM		

### 2012-2013 Chapter Board of Governors

President-Tom Andrews, PE  
 President Elect: Colin E. Laisure-Pool, EIT, LEED  
 Secretary: James Kennelly, EIT  
 Treasurer: Beau Turner, EIT  
 Board Member.: Keith Wheelis  
 Board Member: Pete Menconi, PE  
 Board Member: Frank Schmidt  
 Board Member: Don Brandt

### 2013—2014 Chapter Committees

CTTC Co –Chairs: Justin Niska & Brian Martin  
 Golf Tournament Chair: Tyson Padgett /Justin Niska  
 Historian: John Benson, PE  
 Membership Promotion Chair: Gabe Millican, PE  
 Newsletter Editor: Dianne Langmade  
 Product Show Chair: Charlie Pehl  
 Product Show Co -Chair : Pete Menconi, PE  
 Web-site Developer: Kellie Huff  
 Sustainability Chair: Jeff Steffensen  
 ECC Chair: Dennis Surovcik  
 Research Promotion Chair: Jim Hart  
 Bob Langmade Foundation Chair: Larry Hodgins  
 Student Activities Committee Chair: Scott Sellin,  
 Young Engineers (YEA) - Austin Condon  
 ASU Student Chapter President: Marcus Meyers



# RESEARCH PROMOTION

Contributing online is safe, easy, encouraged, and goes a long way to help our chapter reach its annual \$21,000 Research Promotion goal.

Using your favorite browser, navigate to

<https://xp20.ashrae.org/secure/researchpromotion/rp.html>.

This is a secure website, and it is EASY!



**New York City's iconic skyline serves as the perfect backdrop for the 2014 ASHRAE Winter Conference. With a special focus on the design, development and operation of tall buildings.**

The 2014 Winter Conference takes place Jan. 18-22 at the New York Hilton. To register and for complete Conference information, visit [www.ashrae.org/newyork](http://www.ashrae.org/newyork).

The International Air-Conditioning, Heating, Refrigerating Expo®, held in conjunction with the Winter Conference, runs Jan. 21-23. The Expo, held at the Javits Convention Center, takes place Tuesday, Wednesday, Thursday as opposed to the traditional Monday, Tuesday, Wednesday. More information is available at [www.ahrexpo.com](http://www.ahrexpo.com).

More than 100 New York PDHs, AIA LUs, PDHs and LEED AP credits are available through ASHRAE Learning Institute courses and Technical Program sessions.

The Technical Program features more than 200 sessions addressing building information systems; hydronic system design; improving building performance; indoor environmental air health/IEQ; refrigeration; HVAC&R systems and equipment; and HVAC&R fundamentals and application.

Two particular tracks of note are Tall Buildings, which examines opportunities in the design, development and operation of tall and super-tall buildings, and International Design, addressing innovative design strategies to meet environmental elements, geography and cultures.

Also, choose from 23 Professional Development Seminars and Short Courses to help you stay current on HVAC trends. The ASHRAE Learning Institute offers new updates to Standards 90.1 and 62.1, in addition to 11 new courses that include Standard 55, building enclosure commissioning, electric rates and regulations, health care facilities, building energy audits and ground source heat pumps. ALI courses are approved for renewal of professional engineer and professional architect licenses, as well as for industry certification programs. For a list of all courses, visit [www.ashrae.org/newyorkcourses](http://www.ashrae.org/newyorkcourses).



**ASHRAE 2014 Winter Conference**  
Jan. 18–22, 2014 | New York, NY  
Jan. 21–23, 2014 | AHR Expo



## MAXIMIZING YOUR AVAILABLE RESOURCES PART 2 – APPLICATIONS

By Robert H. Thompson, PE, SmithGroupJJR, Inc.

One of the foundations to HVAC design is the knowledge of the environment. How does the weather inform our design concepts and approaches? How can hourly data reinforce design solutions, or point to the need for new ones? Indeed there is much to consider in the application of HVAC design. If we simply stop with the environment, however, we do our clients a disservice. As much as we try there is not a “one size fits all” solution. Every building is unique, each with its own challenges and opportunities. Good design considers the environment, but great design goes beyond that. Great design does not give up, but always works to be better, to maximize our available resources.

Consider the following example. A new project for community college in the Phoenix Metro area brings classrooms and laboratories together in a common facility for its undergraduate program. The community college has set a goal for energy efficiency, wanting to be an example for others. The program is roughly one third laboratory, with the balance being classrooms and faculty spaces. Campus chilled water is available, with natural gas for heating. The budget seems reasonable, but is not extravagant. As the HVAC design professional, you are tasked with creating an energy efficient solution (that also meets the limitations of the budget).

You have done a number of projects in the Phoenix area and as such have some knowledge of the environment. You have also done some analysis of the hourly data. Based on that environmental analysis, you correctly conclude that the ventilation load is a big part of energy consumption in this project. There are a number of hours, both hot and cold where the project can benefit from some level of energy recovery. You also know that the laboratory is a mix between chemistry and biosafety level 2 research, and that the community college wants redundant laboratory systems to ensure student safety.

The initial proposal has two distinct systems. A dedicated air-handling unit serves both the classrooms and faculty spaces. An energy recovery unit (with an enthalpy wheel) provides for minimum outside air, while the air-handling unit itself has an outside air economizer. The laboratory is served by multiple make-up air-handling units (100% outside air), with a run-around loop installed between the make-up air-handling units and the laboratory exhaust system. As redundancy is a concern, we have a minimum of two make-up air-handling units and two exhaust fans. All of the proposed systems utilize variable-air-volume (VAV) for energy efficiency. All of the proposed fume hoods are also VAV in nature, with a combination of proximity and sash position sensors. A primary-secondary heating water system provides for heating throughout the building.

An energy model completed after schematic design shows that the project is right on track for the energy goals, but the budget is exceeded. Standouts from the budget include capital costs, particularly from the redundant laboratory equipment and sophisticated laboratory systems that ensure space pressurization with a highly dynamic fume hood operation. The community college has a fixed budget, and is faced with the choice between energy efficient design and sacrificing programs for students. As the HVAC design professional, you are first tasked with providing some value engineering (VE) recommendations to reduce cost while preserving a reasonable level of energy efficiency.

This is an all too common example. You struggle with a solution based on that initial configuration, knowing that at every turn you are either sacrificing energy efficiency or redundancy, both of which do not sit well with the client. You feel that you have provided the right “environmental” solution, with little to offer the client than making the systems smaller (without reducing the building program). You are now at a crossroads. Do you keep looking for an alternative solution, or advise the client that the program must be reduced, and potentially risk cancelling the project as it no longer meets their goals?



## MAXIMIZING YOUR AVAILABLE RESOURCES PART 2 – APPLICATIONS, continued

By Robert H. Thompson, PE, SmithGroupJJR, Inc.

In this case, the solution to preserving the owner's program and energy efficiency is to reevaluate your initial system configuration in light of your project's resources. The first step is to go back to the standards and codes to understand the criteria upon which your initial solution is based. The better you understand these standards (and the intent behind them), the more alternate energy efficient solutions become evident. You may even find that these alternate solutions complement each other.

Back to our example in light of ASHRAE 62.1 and our program. This standard identifies minimum outside air rates for spaces based on type and density. It notes further that laboratory spaces are single-pass airflow (not returned to other spaces). This isn't new information as you knew this when you developed the initial solution. You observed that both the make-up and classroom unit are roughly the same airflow, but with the isolated systems there is no way to combine these systems – or is there? The answer lies with an understanding of the laboratory spaces and their use.

The laboratory functions are chemistry and biosafety level 2 (BSL-2) research. Biosafety levels are defined in the Biosafety in Microbiological and Biomedical Laboratories (BMBL) manual published by the Centers for Disease Control (CDC). A careful reading of that manual notes that the biggest risks for transmission of BSL-2 agents is via contact, and the agents are not readily transmissible via aerosol. Any activities which have the potential for generating aerosols or splashing are to occur in biosafety cabinets or other protective enclosures. As the HVAC system is a secondary barrier, there are no specific requirements other than mechanical systems provide an inward flow of air to the laboratory (negative pressure) and air is not recirculated to areas outside the laboratory (single-pass ventilation air).

These two standards, taken together, open the door for a common HVAC system supplying both classrooms and laboratories. The only requirement is that air supplied to the laboratories is not returned to the system (single pass airflow). This now combined approach has both first cost and operational benefits. The critical systems (and redundancy requirements) identified by the client were in reference to the laboratory spaces. Assuming a single air-handling unit in our combined system is sufficient to support the laboratory spaces, the second unit can provide redundancy in a failure condition (laboratories take priority over classrooms through the building management system). The additional make-up air-handling is no longer required in the base case, reducing the first cost of the HVAC system. Note that the redundant laboratory exhaust fans are still required.

Another benefit of the combined system is that the overall ventilation to the building is reduced. The minimum ventilation rates for people are calculated in accordance with ASHRAE 62.1. This can then be the common system then becomes the largest of these two values (and not the sum of both). This results in both operational savings, as well as reductions in central cooling and heating systems (additional first cost savings).

Laboratory fume hood controls may also be simplified in this case. Previously we had to be aggressive with laboratory controls to minimize the amount of overall ventilation and ensure laboratory pressurization is maintained throughout the operating range. In a combined system, we will want to maintain a minimum laboratory ventilation rate to ensure we remain at or above the minimum ventilation rate for people. This approach allows certain laboratories with a minimum number of fume hoods to potentially operate at a constant ventilation rate, simplifying controls. True VAV fume hood control is left to laboratories with multiple fume hoods and high air change rates (when all fume hoods operating). The simplified controls translate to first cost savings, and on-going maintenance is reduced.

By Robert H. Thompson, PE, SmithGroupJJR, Inc.

The program also identified equipment rooms with high sensible loads (refrigerators & freezers). The base case used the ventilation system to provide cooling in this area. This approach, however, requires larger make-up air-handling units and central cooling & heating systems. The solution in this case is found within ASHRAE 62.1 relative to recirculation. Recirculation is not permitted for Class 4 air (fume hood & grease exhaust), but is permitted for all other classifications within the space of origin. This allows for treatment of the additional cooling via a local fan coil unit or active chilled beam system, provided any recirculation air comes from the space of origin. Ventilation air is still provided, but only at a minimum level. This approach reduces the operational costs (less pretreatment of outside air).

The run-around loop is focused on the pretreatment of outside air, and becomes the primary means of energy recovery (the office & classroom energy recovery unit is no longer needed). Controls are also simplified as laboratories with small single hoods utilize constant volume fume hood exhaust with variable volume supply air & general exhaust (flow tracking with an offset for space pressurization). Without the dynamic fume hood operation, high speed actuators and associated laboratory controls are only limited to a few spaces.

The net result of these investigations is an HVAC system that both reduces first cost and increases energy efficiency when compared to the base case. Hidden within each project are numerous resources that, when combined together, may be brought together for a common benefit. Great HVAC design seeks these resources out and, when found, efficiently integrates them together into a seamless and often times simpler solution. The thought process and approach maximize our available resources – by design.

## Message from the President:

Central Arizona ASHRAE members,

As the president your ASHRAE chapter I want to take a moment to let everyone know that there are so many volunteers who work on different committees that make our chapter operate. For example this newsletter is the result of a volunteer chair who is doing a great job. This year we have sent out two newsletters and expect many more. We have chairs who work on our research and promotion events and the difficult task of meeting our ASHRAE goal. This year we are being asked to raise more than \$22,000 for research and promotion. We have a membership chair, a Young Engineers in ASHRAE chair, Chapter Technology Transfer Chair, and on and on. Our secretary and treasurer as well as our president elect are all elected members but they too are volunteers. I guess what I am saying to everyone is thank you to the members for supporting us, and thank you to all of the volunteers who are doing such a great job. If you receive this newsletter please consider speaking to one of your board members or chairs about how you might become involved with a committee. This could be the beginning of your path through the chairs to become president. If I can do it, I know that there are many engineers out there who are capable and willing to commit their time to improving the Central Arizona Chapter of ASHRAE.

I hope that all is well and I would like to ask that you feel free to contact me with your comments or feedback.

[toma@mpswinc.com](mailto:toma@mpswinc.com) or 602-821-1711

Regards,

Tom Andrews, P.E.

