

# THE AUSTIN REGISTER

American Society of Heating, Refrigerating and Air Conditioning Engineers  
Austin, Texas  
[www.ASHRAE-Austin.org](http://www.ASHRAE-Austin.org)



Chapter Year 2003-2004

September 2003

## PRESIDENT'S MESSAGE

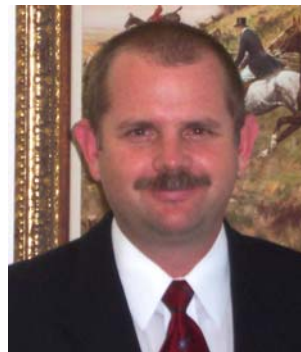
Our first meeting of the 2003-2004 ASHRAE season started off in grand style. We feasted on barbeque at the County Line restaurant and enjoyed visiting with DRC Hugh McMillan, hearing about on his recent trip to the Monterrey Mexico Chapter, and learning about ASHRAE's upcoming news and events. We are very fortunate to be included in a Region diverse in culture and approach to business, while sharing the common interests in ASHRAE. The accommodations at the restaurant, as well as the view were superb, so this local has certainly been added to our list of possible meeting venues for the future. Thanks to Jeremy Smith and Randy Schrecengost for their work on organizing the program.

For the technical session, Mr. Scott Whigham and Mr. Steve Houtz with Ingersoll Rand, gave a presentation on compressed air storage design and showed how a properly de-

signed compressed air storage system can translate directly into reduced compressor sizes and energy savings. After the technical session, Scott and Steve provided a presentation on compressed air basics. They showed how a thorough audit of a plant's compressed air system can translate directly into reduced operating costs, improved productivity, and reduced capital spending. They also discussed the three primary types of compressors; reciprocating, rotary, and centrifugal and the various configurations of air-cooled, water-cooled, and multi-stage types available.

As, another reminder, please sign-up for the October seminar on *Carbon Chemical Filtration Applications*. This promises to be a very beneficial seminar for those involved with ventilation and Standard 62 issues. Contact Randy Schrecengost (see application in this newsletter) for more details or to send in your application.

This month, we are going to meet at the County Line on the Hill again and will host Mr. Steven Rowley, of Particle Measuring Systems, for a Technical Session presentation on *Molecular Monitoring* and Mr. Mark Huza, of Camfill, on *Chemical Filtration Technologies* for the main presentation. This should serve as a good primer for the upcoming seminar. See you at the Hill!



Respectfully submitted,  
*Wes Goodwin, P.E.*  
Chapter President

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### Special points of interest:

#### Next Chapter Meeting:

When: Thurs., Sept. 18th  
Where: County Line (on the Hill)  
6500 Bee Caves Road  
Map Provided  
(512) 327-1742

Social Hour: 5:30-6:00 p.m.  
Tech Session: 6:00-6:15 p.m.  
Dinner: 6:15-7:00 p.m.  
Main Program: 7:00-8:00 p.m.  
Cost is \$20/person

Next Board of Gov. Meeting  
When: Thur., Sept 18th  
4:30 p.m.  
Where: County Line (on the Hill)  
6500 Bee Caves Road  
Public Invited

#### Please RSVP to:

**Jeremy Smith**  
**Ph 512-744-4400**  
**Fax 512-744-4444**  
[smithj@auseea.com](mailto:smithj@auseea.com)



## **September Technical Session and Main Program Summary**

*Submitted by: Jeremy Smith*

### **Technical Session: “Real Time Detection of Airborne Molecular Contamination” by Steve Rowley**

There are a number of ways to decontaminate air and equally as many ways to measure contaminants within the air. One particular technology used to detect Airborne Molecular Contamination (AMC), in real time, is Surface Acoustics Wave (SAW) technology. Applications for this technology have been in the semiconductor, hard disk drive, flat panel display and aerospace industries.

Mr. Rowley is an applications engineer with Particle Measuring Systems, focusing on molecular contamination monitoring. He has 6 years of previous experience in the semiconductor industry in the Yield Enhancement and Contamination Control areas.

### **Main Program: “High Performance AMC Filtration Solutions” by Mark Huza**

Airborne Molecular Contamination (AMC) can diminish the yield in many microelectronics manufacturing processes. HEPA and ULPA filters are unable to remove these contaminants. And traditional carbon filters are inappropriate for the challenge conditions found within contemporary fabs. New contamination control processes are required to coincide with the rapidly advancing Nano-Technology Nodes and beyond. This presentation will discuss the unique challenges the Semiconductor Industry is facing and present high performance AMC filtration solutions that address these challenges.

Mark Huza is the Carbon Segment Manager of Camfil-Farr, operating out of their Washington, North Carolina manufacturing facility. Mark has been with Camfil-Farr for 4 years and has 20+ years experience in the industry. His responsibilities include the application of sorption and/or hazardous contamination filtration products in comfort air, clean processes and safety & protection market segments.

He is or has been involved with the following industry organizations:

- ASHRAE (General gas phase and particle contamination control)
- Instrument Society of America (ISA) (Electronics Corrosion Control)
- Building Owners and Managers Association (BOMA) (Indoor air quality control)
- American Biological Safety Association (ABSA) (Chemical and Biological Contamination Control)
- Institute of Environmental Sciences & Technology (AMC control in cleanroom environments)

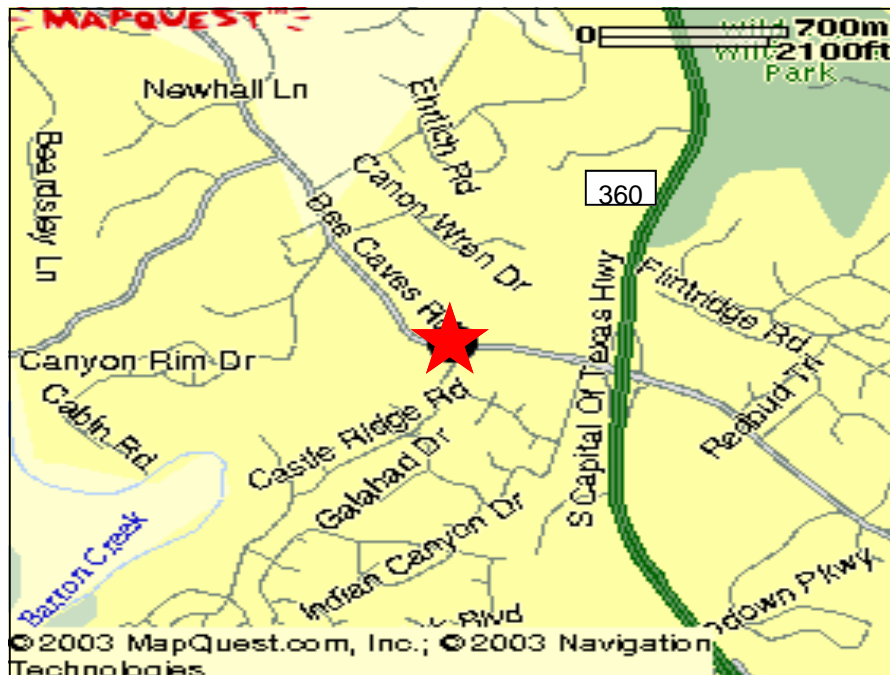
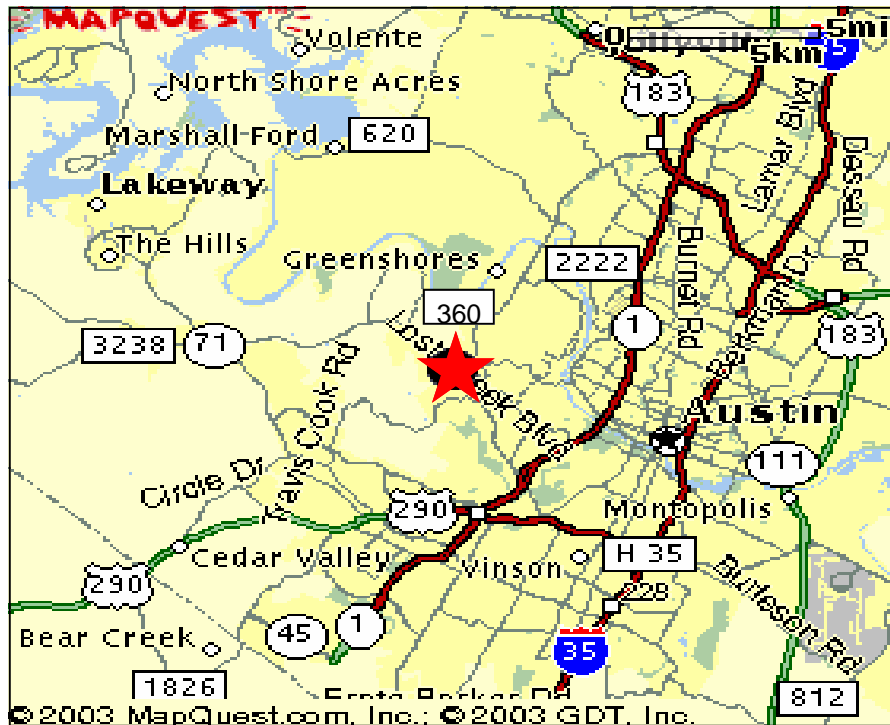
Within these organizations, he has been involved in the preparation of international standards, international position papers, the publication of Recommended Practices, the funding of international research initiatives, the co-sponsorship of international conferences as well as the establishment of training presentations and educational courses.



**DIRECTIONS:**

From North Austin: Take HWY 360 S. Exit Bee Caves Road and go Right. Restaurant will be 1/2 mile on the right.

From South Austin: Take HWY 360 N. Exit Bee Caves Road and go Left. Restaurant will be 1/2 mile on the right.



**2003-04 BUDGET REPORT (Fiscal Year Ending 6/30/04)**

For Period Ending 8/31/03

Category Name	Budgeted Income	Budgeted Expenses	Year to Date Income	Year to Date Expense	Year to Date Budget Balance
<b>Chapter Dues</b>	\$3,450.00		\$0.00	\$0.00	\$3,450.00
<b>Golf Tournament</b>					
Income	\$18,500.00		\$0.00		\$18,500.00
Expense		\$10,500.00		\$0.00	\$10,500.00
<b>Product Directory</b>					
Income	\$5,000.00		\$0.00		\$5,000.00
Expense		\$1,700.00		\$0.00	\$1,700.00
<b>Trade-Shows-Seminars</b>					
Income	\$2,000.00		\$0.00		\$2,000.00
Expense		\$1,000.00		\$0.00	\$1,000.00
<b>Education Fund</b>		\$2,000.00		\$0.00	\$2,000.00
<b>Guest Speaker</b>		\$500.00		\$0.00	\$500.00
<b>Meeting Meals</b>					
Income	\$5,000.00		\$0.00		\$5,000.00
Expense		\$6,000.00		\$675.23	\$5,324.77
<b>Student Meeting Meals</b>					
Income (donations)	\$1,000.00		\$0.00		\$1,000.00
Expense		\$1,000.00		\$0.00	\$1,000.00
<b>Newsletter</b>					
Postage		\$900.00		\$0.00	\$900.00
Printing		\$200.00		\$0.00	\$200.00
<b>Region VIII Fee</b>		\$150.00		\$0.00	\$150.00
<b>Research Contributions</b>					
Expense		\$8,000.00		\$0.00	\$8,000.00
<b>Student Memberships</b>		\$200.00		\$0.00	\$200.00
<b>Supplies/Software</b>		\$40.00		\$110.42	-\$70.42
<b>Website</b>		\$430.00		\$0.00	\$430.00
<b>Miscellaneous</b>		\$500.00		\$250.00	\$250.00
<b>Total Income</b>	\$34,950.00		\$0.00		\$34,950.00
<b>Total Expenses</b>		\$33,120.00		\$1,035.65	\$32,084.35
<b>Year to Date Cash Balance</b>					<b>-\$1,035.65</b>
<b>Wells Fargo Checking Account</b>					
<b>Beginning Balance</b>		<b>\$12,637.78</b>	<b>Ending balance</b>		<b>\$11,602.13</b>

Submitted by: Tom Green, PE



**Austin ASHRAE  
BOG Meeting Agenda  
August 21, 2003  
County Line BBQ**

1. Wes Goodwin, President
  - a. Introduced DRC for Region VIII, Hugh McMillan
  - b. Discussed possible joint meeting with Alamo Chapter.
2. Mark Merriman, President Elect
  - c. Newsletter – First newsletter was success, very good comments from everyone. Need info from BOG by first Friday of every month. Hope to send out newsletter on second Friday of every month.
3. Jeremy Smith, Vice President
  - d. Programs – Discussed student night and possible locations.
  - e. Discussed charging members who RSVP and then do not show. Also discussed \$5 penalty for people who don't RSVP.
  - f. Webmaster – Site is up and running and will be continuously updated. Please visit and offer and advice on how to make better.
  - g. In process of filing tax for 2002.
4. Cameron Labunski, Secretary
  - h. Meeting Minutes for all BOG meetings, posted in newsletter.
5. Tom Green, Treasurer
  - i. Transfer of accounts from Jeremy to Tom was successful.
6. BOG 1
  - j. Research Promotion-In process of getting started.
7. Mike Davidson, BOG 2
  - k. PAOE –Handed out info for new POAE last meeting.
  - l. Asked BOG to start working with RVCs to get planning points.
8. Randy Schreengost, BOG 3
  - m. Membership – Ken Simpson, phone committee
  - n. Honors and Awards – Bill Klock
  - o. Reception – Paul Cherry
  - p. Roster – Morgan Stinson
  - q. Seminars-Updated
  - r. Historian- No update.
9. Glenn See, BOG 4
  - s. TEGA-Going to meet with local Engineer Firms to discuss possible projects.
  - t. Will handle PDH credits by asking members request a certificate when checking in.
10. Drew Harrison, BOG 5
  - u. Student activities-Starting to contact colleges for fall visits.

Next meeting-September 18, 2003-County Line on the Hill



# ASHRAE Program Organizer

## Year 2003-2004

Month	Date	Location	Tech Session			Theme
			Speaker	Company	Topic	
August	8/24	County Line (on the hill)	Scott Whigham & Steve Houtz	Ingersoll-Rand	Flow Control and Regulation of Compressed Air	Membership Promotion
September	9/18	County Line (on the hill)	Steven Rowley	Particle Measuring Systems	Airborne Molecular Monitoring	RP
October	10/16	Travis County Expo Ctr	TBA	TBA	Refrigeration Tour	Student Month
Nov/Dec	TBA	County Line (on the hill)	TBA	TBA	Stress Management	Holiday Banquet
January	1/15	County Line (on the hill)	TBA	TBA	Air to Air Energy Recovery	TBA
February	2/19	County Line (on the hill)	TBA	TBA	The Benefits of Testing and Balancing	TBA
March	3/18	County Line (on the hill)	TBA	TBA	Design Implications - Energy Code	TBA
April	4/15	County Line (on the hill)	TBA	TBA	Introduction to LEED and USGBC	Nominating
May	5/20	County Line (on the hill)	Ken Luther	Bell and Gossett	TBA	Officer Induction

Month	Date	Location	Dinner Presentation			Theme
			Speaker	Company	Topic	
August	8/24	County Line (on the hill)	Scott Whigham & Steve Houtz	Ingersoll-Rand	Designing and operating compressed air systems for lowest overall cost.	Membership Promotion
September	9/18	County Line (on the hill)	Mark Huza	Camfil	Carbon/Chemical Filtration Tech	RP
October	10/16	Travis County Expo Ctr	TBA	TBA	Refrigeration Tour	Student Month
Nov/Dec	TBA	County Line (on the hill)	TBA	TBA	Stress Management	Holiday Banquet
January	1/15	County Line (on the hill)	TBA	TBA	Panel Discussion: Energy Recovery	TBA
February	2/19	County Line (on the hill)	TBA	TBA	The Benefits of Commissioning	TBA
March	3/18	County Line (on the hill)	TBA	TBA	Rooftop Equipment Acoustics	TBA
April	4/15	County Line (on the hill)	TBA	TBA	Tips on How to Avoid Being Sued and Limit Your Exposure	Nominating
May	5/20	County Line (on the hill)	Ken Luther	Bell and Gossett	TBA	Officer Induction

*Submitted by: Jeremy Smith*

Attendance Report	
Members	29
Life Members	0
Students	0
Guests	2
<b>Total</b>	<b>31</b>

*Submitted by: Paul Cherry*



# ASHRAE

## Chemical Filtration Applications Design Seminar

Conducted by

*Purafil, Inc.*



**EnerSave**

➤ Are indoor air quality and energy conservation mutually exclusive goals? The use of filtration and recirculation for compliance with ASHRAE Standard 62.1.

➤ The specialized filtration needs for museums, libraries, and archives.

➤ Airborne molecular contamination (AMC) control for the semiconductor, disk drive, and microelectronics industry – assessment, control, and monitoring considerations.

➤ General IAQ and odor control for commercial applications – airports, hospitals, recreational facilities, office buildings, animal research facilities



**AMC**

# Austin ASHRAE Filtration Systems Design Seminar

## Seminar Info

October 9, 2003 11:30 am – 4:30 pm

Dynamic Systems Conference Room (3901  
South Lamar, Suite 300)

**Cost:** \$50 / person

**RSVP:** Fill out the following form and fax  
to 512-933-5617



**PURAFIL**  
First...in clean air



# Austin ASHRAE Seminar Filtration Systems Design

Please fill out form below and fax to 512-933-5617  
Call Randy Schrecengost at 512-933-3426 for any Questions

**REGISTRATION DEADLINE: October 2, 2003**

## Registration Form Chemical Filtration Applications Design Seminar

### Fee - \$50 / person

October 9, 2003 11:30 am - 4:30 p.m.

DSI Training Room

3901 South Lamar, Suite 110

Austin, Texas

Attendees need to arrive beginning at 11:30 for lunch, Seminar will start promptly at 12:30 pm.

Name:

Company:

For Payment With Credit Card\*

Name on  
Credit Card

E-mail  
Address:

Credit Card  
Number

Credit Card  
Exp. Date

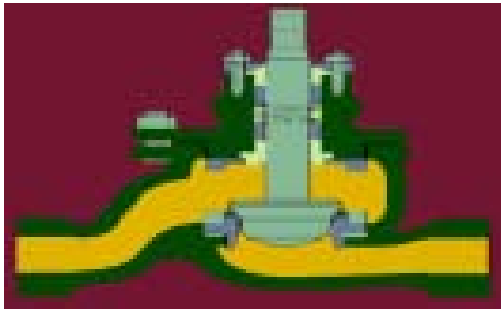
**\*\*Note: Credit Card Charges will  
appear on your statement as  
"DataBank"**

**\*If paying by check, make payable to "Austin ASHRAE" and mail with payment to  
Randy Schrecengost  
Attn: ASHRAE Seminar  
Motorola, 3501 Ed Bluestein Blvd, MD: L-12  
Austin, TX 78721**

**Class Size is limited to 80 people. Please register early.**

# ASHRAE Control Valves & Industrial Regulators Applications Seminar

Conducted by  
***Cashco, Inc.***



o You will develop a basic understanding of the operations and function of various types of control valves and industrial regulators.

o The Control Valve subject matter will include: terminology, basic designs, characterization of trim design, technical considerations, actuator basic designs, valve unit action, actuator bench-set range, valve positioner basics, control loop actions, packing designs, and seat leakage.

o The Industrial Regulator subject matter will include: operational aspects of pressure reducing and back pressure regulators, point force vs. distributed force, force balance principles, flow to open vs. flow to close designs, dome loaded and differential types for regulators, and proportional band (droop, and pressure build) cause and effects.

## Austin ASHRAE Seminar Control Valves & Industrial Regulators

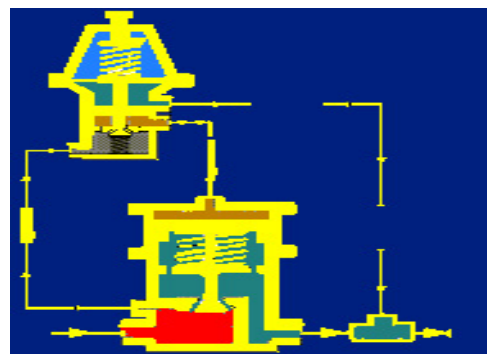
### Seminar Info

November 12, 2003 11:30 am – 4: 30 pm.

Dynamic Systems Conference Room (3901 South Lamar, Suite 110)

**Cost:** \$50 / person

**RSVP:** Fill out the following form and fax to Randy Schrecengost 512-933-5617





# Austin ASHRAE Seminar Control Valves & Industrial Regulators

Please fill out form below and fax to 512-933-5617  
Call Randy Schrecengost at 512-933-3426 for any Questions

**REGISTRATION DEADLINE: November 5, 2003- 1 week prior**

## Registration Form Control Valve & Industrial Regulators Seminar

### Fee - \$50 / person

November 12, 2003 11:30 am - 4:30 p.m.

DSI Training Room

3901 South Lamar, Suite 110

Austin, Texas

Attendees need to arrive beginning at 11:30 for lunch, Seminar will start promptly at 12:30 pm.

Name:

Company:

For Payment With Credit Card\*

Name on  
Credit Card

E-mail  
Address:

Credit Card  
Number

Credit Card  
Exp. Date

**\*\*Note: Credit Card Charges will  
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**\*If paying by check, make payable to "Austin ASHRAE" and mail with payment to  
Randy Schrecengost  
Attn: ASHRAE Seminar  
Motorola, 3501 Ed Bluestein Blvd, MD: L-12  
Austin, TX 78721**

**Class Size is limited to 80 people. Please register early.**



## **Taking A Load Off The National Power Grid: New Solar-powered Window System Heats, Cools, Lights, And Shades Commercial Buildings**

TROY, N.Y. -- A team of researchers at Rensselaer Polytechnic Institute has developed the first of its kind solar-powered, integrated window system that could significantly reduce dependency on the same energy grid that caused the biggest power outage in U.S. history. Designed to function as a shading system, the Dynamic Shading Window System (DSWS) uses a newly developed solar-energy technology to convert the sun's light and diverted heat into storable energy that can be used to also efficiently heat, cool, and artificially light the same office building.

Developed primarily for commercial buildings, the DSWS blocks the harshest rays while allowing the most pleasing daylight to stay in a building's interior.

"Our system, which can be incorporated into existing commercial buildings as well as new ones, could become a significant part in the development of an overall energy plan to reduce dependence on the national power grid. This could save businesses -- the biggest consumers of energy -- untold utility costs and significantly reduce U.S. need for fossil fuels," says Anna Dyson, assistant professor of architecture who co-developed the DSWS.

### **How It Works**

The DSWS system is made of clear plastic panels that fit in between two panes of glass. On each panel are dozens of small, pyramid-shaped units, or "modules," made from semi-translucent focusing plastic lenses, that track the motion of the sun. Sensors, embedded in the walls or the roof, ensure that the units are always facing the sun to capture all incoming rays while at the same time deflecting harsh, unwanted rays from a building's interior.

Each unit holds a miniaturized photovoltaic (PV), or solar-cell, device used to collect light and heat that is then transferred into useable energy to run the motors, also embedded in the building's interior walls. The remaining energy is used

for heat, air conditioning, and artificial lighting. The surplus energy can be directly and automatically distributed through wires inside a building's walls, or can be stored in a group of batteries, for later use.

"This solar-powered technology will provide the typical business office the most superior lighting available--natural daylight. It will allow for better views outside your window that are no longer hidden by a standard shade or obscured by penetrating glare," says Dyson.

Reprinted from ASHRAE's "The HVAC&R Industry" electronic publication.



## Energy Simulation Results vs. Actual Data Studied by ASHRAE

KANSAS CITY, Mo. -- Some \$175 billion is spent each year on energy by United States businesses and institutions.

Performance contracts and energy service agreements whose primary objective is to reduce energy use without compromising comfort is growing, aided by cheaper monitoring technology and integration with energy management and control systems.

Building energy simulation programs are used for estimating potential savings when various energy conservation measures are installed as well as to verify savings from installed retrofits.

While they are highly accurate under specified inputs, the reliability of the results is frequently compromised by a lack of certainty that the simulation results reflect actual conditions, according to Agami Reddy, Ph.D., P.E.

"While it is easy to match simulation results with utility bills, it is considerably harder to reconcile hourly or even daily monitored data," he said. "There is little systematic guidance available to practitioners as to how to modify simulation programs so as to match measured data."

Research to develop a systematic methodology by which the discrepancy between the results of building energy simulation computer programs and measured energy data from actual buildings can be minimized will be conducted by ASHRAE.

ASHRAE approved funding totaling \$986,953 for eight research projects in the areas of indoor air quality, comfort and health, energy conservation, operating and maintenance tools, environmentally safe materials and design tools at its 2003 Annual Meeting held here June 28-July 2.

Among them is 1051-TRP, Procedures for Reconciling Computer-Calculated Results with Measured Energy Data. Reddy, a faculty member at the Civil, Architectural and Environmental Engineering Department, Drexel University, Philadelphia, Pa., is the principal investigator. The project is expected to take 18 months with ASHRAE contributing \$79,660. The research is sponsored by ASHRAE Technical Committee 4.7, Energy Calculations.

The results of the research will be featured in an ASHRAE publication, containing methodology, algorithms, recommendations, presentation formats and quantitative references of how to reconcile results of simulation programs developed with ASHRAE toolkits with actual measured building energy use data.

Reprinted from ASHRAE's "The HVAC&R Industry" electronic publication.



## Kitchen Hood Performance Studied By ASHRAE

KANSAS CITY, Mo. -- The position of appliances in a restaurant certainly doesn't figure into the dining plans of most customers.

But new research into the impact of diversity of equipment and its position on the performance of commercial kitchen hoods will result in cost savings and better operating kitchens, both of which may benefit customers. Commercial kitchens typically use exhaust hoods to remove effluents, such as smoke, grease and moisture, generated by cooking operations.

To provide optimum energy efficiency, it is desirable to operate with the minimum exhaust flow needed to provide sufficient capture and containment of effluents. Higher exhaust usually leads to higher HVAC loads to condition replacement air.

Research comparing the impact of the position of a single appliance vs. multiple appliances under hoods on the minimum exhaust airflow required will be conducted by ASHRAE.

"The research will help manufacturers and installers of HVAC and kitchen ventilation equipment implement systems that are more cost competitive and provide cost savings for their customers," Richard Swierczyna, a principal investigator of the project, said. "Restaurant designers and consulting engineers will benefit by gaining a better knowledge of kitchen ventilation systems, which will help in providing better operating kitchens for their customers."

ASHRAE approved funding totaling \$986,953 for eight research projects in the areas of indoor air quality, comfort and health, energy conservation, operating and maintenance tools, environmentally safe materials and design tools at its 2003 Annual Meeting held here June 28-July 2.

Among them is 1202-TRP, Effect on Commercial Kitchen Hood Performance of Appliance Diversity and Position. The principal investigators are Swierczyna, Architectural Energy Corp., Boulder, Colo., and Donald Fisher, P.Eng., Fisher-Nickel Inc., San Ramon, Calif. The project is expected to take a year to complete at a cost of \$105,033. It is sponsored by ASHRAE Technical Committee 5.10, Kitchen Ventilation.

The research will build on existing capture and containment studies from single appliance operations to multiple appliances underneath hoods. It also will examine how appliance positions underneath hoods may impact required capture and containment airflows.

"If ventilation manufacturers, kitchen designers and consulting engineers knew that they could specify operation of hoods with multiple appliances at lower flow rates, operations might benefit from lower energy costs while also realizing improved performance -- less heat gain and greater personnel comfort," Swierczyna said. "End-users would see these savings in the form of both lower first and operating costs over the lifetimes of equipment. The comfort issue also has economic consequences in terms of personnel performance and turnover costs."

Results of the study may be incorporated into codes, standards and design guides to assist code officials, commercial kitchen and building designers, consulting engineers and ventilation manufacturers with efficient restaurant design and operation.

Reprinted from ASHRAE's "The HVAC&R Industry" electronic publication.



Left: Region VIII DRC, Hugh McMillan visits our first Chapter meeting of the year and updates the chapter on ASHRAE's upcoming events locally and at the Society level. Above: DSI's Matt Maxwell and John Marchand enjoy the BBQ and refreshments at the County Line.



Austin ASHRAE Board of Governor's members Glenn See and Mike Davidson get a picture with special guest Hugh McMillan.

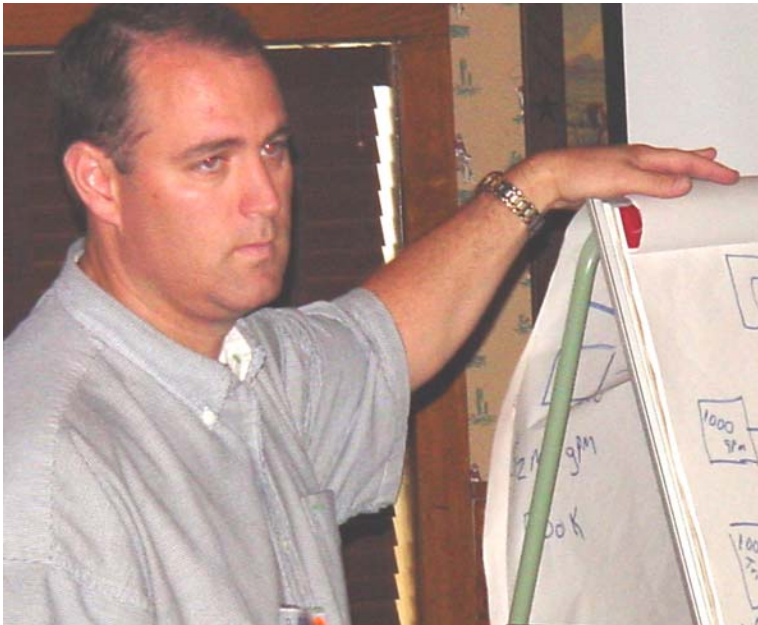
**Wake up Mike!**

Hard at work! Jeremy Smith (VP), Tom Green (Treasurer), and Wes Goodwin (President) discuss important topics at the Board of Governor's meeting.





Fritz Stinson and Todd Schmitt of EEA participate in last month's presentation.



Scott Whigham of Ingersoll Rand delivers an excellent presentation on Compressed Air Systems.

# PDH Credits

Get PDH Credits for attending each ASHRAE meeting. Certificates will be issued at the following meeting. Be sure to request a certificate when signing in.



# THE AUSTIN REGISTER

Austin ASHRAE Chapter  
 c/o YORK International  
 2101 E. St Elmo, Suite 330  
 Austin, Texas 78744



## THE AUSTIN ASHRAE CHAPTER VOLUNTEERS - 2003 - 2004

Position	Name	Bus. Ph.	Fax	E-Mail
President	Wes Goodwin, P.E.	512-349-9667	512-349-9668	wes.goodwin@goodwinengineering.com
President-Elect	Mark Merriman	512-481-0220	512-499-8528	mark.merriman@york.com
Vice President	Jeremy Smith	512-744-4417	512-744-4444	smithj@auseea.com
Secretary (Parliamentarian)	Cameron Labunski	512-440-8333	512-440-8328	clabunski@acreng.com
Treasurer	Tom Green, P.E.	512-345-7793	512-345-7201	tomg@tgce.com
<b>BOARD OF GOVERNORS</b>				
BOG - 1 (1st PP)				
BOG - 2	Randy Schrecengost, P.E.	512-934-3421	512-934-7277	ra6557@email.sps.mot.com
BOG - 3	Mike Davidson	512-894-3086	512-894-0867	stepheng@htseng.com
BOG - 4	Glenn See	512-443-4848	512-443-7575	gsee@tab-tech.com
BOG - 5	Drew Harrison	512-416-8822	512-416-8894	dharrison@trane.com
<b>COMMITTEE CHAIRS</b>				
CRC Delegate (President)	Wes Goodwin, P.E.	512-349-9667	512-349-9668	wgoodwin@goodwineng.com
CRC Alternate Delegate (Vice President)	Mark Merriman	512-481-0220	512-499-8528	mark.merriman@york.com
Research Promotion (1st PP)	Jim Ruth, P.E.	512-443-4848	512-448-9802	jruth@dynamicsys.com
Golf	Jim Ruth, P.E.	512-443-4848	512-448-9802	jruth@dynamicsys.com
Membership Promotion/Communication-Telephone	Ken Simpson	512-744-4400	512-744-4444	simpsonk@auseea.com
Honors and Awards	Bill Klock, P.E.	512-744-4410	512-744-4444	KlockB@auseea.com
Reception	Paul Cherry	512-349-9667	512-349-9668	paul.cherry@goodwinengineering.com
Roster	Ken Simpson	512-744-4400	512-744-4444	simpsonk@auseea.com
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