

# Sol Air

Newsletter of the Southern California Chapter: American Society of Heating, Refrigerating and Air Conditioning Engineers, Inc.  
November 2005

Web site: [www.ashrae-socal.org](http://www.ashrae-socal.org)

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## EGA / CODE COMPLIANCE NOVEMBER 1, 2005 MEETING INFO

LES FRERES TAIX

1911 Sunset Blvd., Los Angeles, California

**5:30 Tech Program: Introduction to eQUEST  
Energy Simulation Tool**

**Speaker: Mr. Marlin Addison, M.S.  
Addison and Associates**

**6:05 Social Hour (Fun Time!)**

**6:45 Dinner**

\$27 with reservation

\$30 without reservation

\$10 student member

Meal choice will be Chicken Marsala and Pot  
Roast Beef

**7:45 Main Program: 2005 Title 24 Update  
Mechanical Perspective / ASHRAE 90.2**

**Speaker: Ms. Gail Stranske**

**9:00 Meeting Ends**

Reservations: Michelle Sangalang, (626) 854-4613,  
[m.sangalang@us-ac.com](mailto:m.sangalang@us-ac.com) or Scott Gilchrist, (626) 854-  
4612, [s.gilchrist@us-ac.com](mailto:s.gilchrist@us-ac.com) by Mon., Oct. 31, 2005.



## NOVEMBER MAIN PROGRAM: 2005 TITLE 24 UPDATE MECHANICAL PERSPECTIVE / ASHRAE 90.2

Speaker: Ms. Gail Stranske

With the implementation of the new 2005 Title-24 Energy Efficiency Standards effective October 2005, building design and construction in California must now meet stringent energy performance requirements. The presentation will highlight the major changes occurring in the 2005 Title-24 standards, with a particular emphasis on how these changes will impact mechanical system design. Topics covered will include a summary of the energy efficiency measures now prescriptively required by code, a discussion of the new Time Dependent Valuation (TDV) method used for documenting performance compliance, and a brief look at the types of mechanical system efficiency measures that will look most favorable using a TDV analysis.

As a project manager for CTG Energetics, Gail Stranske provides energy consulting services including building energy simulation and analysis, energy auditing, commissioning and energy training software development. Her experience includes identification, analysis, and computer modeling of energy efficiency opportunities for new and existing facilities. She is competent with DOE-2.1e, DOE2.2, VisualDoe, eQUEST, and EnergyPro; and is well-versed in both California Title-24 and ASHRAE 90.1 code compliance.

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President  
Chad Herrick



It's November! I know this because it is supposed to be Fall, but the Santa Ana season is making the weather the hottest of the year and my wife has already completed her Christmas shopping. This seems neurotic to me too, but I don't have to do it so I won't complain. November also means the third meeting of the year and it is surely one that you will not want to miss. The Technical forum will cover eQuest Energy simulations and the main program topic is the 2005 Title 24 update. These two topics affect all of us and this is information that you need to know.

I want to extend the gratitude of the Chapter membership to LA Air Balance and Mr. Mark MacCraken of CalMac for their presentations in last month's Technical Session and Main program. If you missed the meeting, check out the meeting recap in this issue of the *Sol Air*.

Since we are now a few months into the ASHRAE year, I would like to recognize the efforts of our Board members. My intention is to make this a running commentary on their efforts, so I will only mention two in this article with recognition of others in the coming months.

David Kuo, our President Elect, has done a great job of scheduling all of the programs for the year. This job is a lot tougher than you may think and his efforts have not gone unnoticed. If you have any great program ideas for next year, pass them on to David.

Karine Leblanc, who has lead the way in reconstructing our Web site, handling the attendance/reception at the meetings, E-week and the meeting raffle, makes her about the busiest board member we have. She is a great asset and I am glad that she is on our team.

Speaking of the raffle, you know that the money generated supports Chapter scholarships and ASHRAE research, so I encourage you to donate raffle prizes to support these efforts. Contact Karine if you have any questions.

Happy Thanksgiving!

## NOVEMBER TECH MEETING: INTRO TO EQUEST ENERGY SIMULATION TOOL

Speaker: Mr. Marlin Addison

Everyone can use a quick energy simulation tool. There are many energy simulation tools available in the industry. Often the challenge with such tools is a balance between results accuracy and ease of use. Mr. Marlin S. Addison will provide an overview of eQUEST, a sophisticated, yet easy to use whole-building energy use analysis tool which provides professional-level results with unprecedented ease. Features of eQUEST that will be of interest to ASHRAE members include the following:

- ❖ eQUEST is freeware (available for free download from [www.energydesignresources.com](http://www.energydesignresources.com))
- ❖ performs automated Savings By Design utility incentive analysis
- ❖ certified for non-residential Title 24 performance compliance
- ❖ is a full implementation of DOE-2.2
- ❖ wizards make it easy to use, especially in early schematic design
- ❖ includes a wide range of reporting from very high level to very detailed
- ❖ very soon to include automated LEED analysis
- ❖ free one-day training workshops are available locally (sponsored by Edison at CTAC in Irwindale)
- ❖ the presentation will include Q&A time and will include a comparison of energy simulation results with Carrier HAP and Trane Trace

Marlin S. Addison is Principal of M.S. Addison and Associates, Tempe, AZ and serves as Clinical Assistant Professor and Director of the Building Energy Simulation Lab at Arizona State University. Mr. Addison is recognized nationally as the leading expert in the U.S. in the professional use of computerized energy and economic analysis.

He has more than twenty years of experience designing and evaluating residential, commercial and industrial facilities using detailed energy-use simulation methods and has presented more than two hundred professional seminars on detailed simulation methods and economic analysis. Mr. Addison has worked closely with J.J. Hirsch and Associates in continuing support, development and training for PowerDOE® and eQUEST. During his career, he has consulted on some of the nation's most notable showcase sustainable building projects including the National Audubon Society Headquarters in New York City, the

headquarters of the American Association for the Advancement of Science in Washington, D.C., and the Natural Resources Defense Council office in Santa Monica, CA.

## OCTOBER MAIN MEETING RECAP

By Chad Herrick, P.E.

I know what you were thinking; I have no experience designing thermal storage systems and nobody has ever asked me to be involved with the design or engineering of one; so why should I go to see this program at the ASHRAE meeting. Well, you missed out. Mark MacCraken of CalMac and an ASHRAE distinguished lecturer presented an informative program that outlined the basic parameters of thermal storage systems and the potential energy savings that can be realized when properly applied.

We discussed several existing installations and the energy savings that have been achieved, allowing these subject projects to meet and exceed ASHRAE 90.1 and Title 24. Furthermore, thermal storage systems have been utilized in many LEED accredited projects.

With the ever-increasing focus on energy savings and the long-term goal of ASHRAE to bring about the design of zero energy buildings, there is little doubt that thermal energy storage is a technology that we will be seeing more of.

Mr. MacCraken is the President and CEO of CalMac Manufacturing Corporation, whose main products are used for off-peak thermal storage for building cooling. Mr. MacCraken's experience with more than 6,000 installations in over 35 countries and his authoring several articles for the ASHRAE journal made him an ideal candidate to speak on this topic.

If you missed the meeting and want to know more, research Mr. McCracken's archived articles through the ASHRAE Web site.



*David Kuo presents Mark M. MacCracken with a certificate of appreciation.*

## OCTOBER TECH FORUM RECAP

By David Kuo, P.E.

The Tech Forum was presented by Eddie Alejandro, President of Los Angeles Air Balance located in Upland. He was accompanied by Gabriel Alejandro, who brought a duct leakage testing apparatus consisting of a fan, flexible duct connection, differential pressure meter, and an orifice tube. The type and size of the apparatus depends on the amount of air flow and the design static pressure of the ductwork system.

Recent changes in the new Title 24 Standards have brought forth the requirement for air duct leakage testing and sealing. There are a number of stakeholders involved in any given project, including the consulting engineer, installing contractor, and Testing and Air Balance contractor. Consequently, there are a number of different guidelines that are suggested and recommended:

- ❖ 2005 Title 24 – maximum 6% leakage
- ❖ Sheet Metal and Air Conditioning Contractors' National Association (SMACNA) – no testing required for systems < 3" static pressure
- ❖ Associated Air Balance Council (AABC) – maximum 2% leakage associated with a given pressure
- ❖ Kahoe Manual – maximum 1% leakage at 1.5 times the system pressure
- ❖ Owner – zero % leakage

One thing for sure, we can no longer ignore air leakage in HVAC ductwork.



*October's Tech Forum Speaker, Eddie Alejandro*

## DECEMBER JOINT MEETING

Mr. Jan Sundell is an environmental scientist from Sweden with a unique background in both engineering (M.Sc.Eng) and medicine (Dr.Med.Sc). Before going into science, he was responsible for building codes and occupational health legislation in Sweden and the Nordic countries. He was the main author of a model building code for ventilation in homes for UN. He has conducted several large multi-disciplinary studies on associations

between indoor environmental factors and health. His efforts have focused on ventilation, the causes of sick building syndrome, and for the increase in allergies/asthma. He has led numerous European multi-disciplinary reviews of the total scientific literature with regard to indoor climate and health. He has served on the Board of Directors of The International Society of Indoor Air Quality and Climate (ISIAQ), is Vice President of The International Academy of Indoor Air Sciences, and is the Editor-in-Chief of the most prestigious scientific journal within the field of "Indoor Air". Within ASHRAE, he is a member of SSPC 62.1, the Environmental Health Committee, and is the Chair of EHC Subcommittee for Research. He is an excellent provocative lecturer with outstanding knowledge on the need of ventilation and the importance of indoor air factors for health.

### Lecture Topics:

- ❖ The History of Ventilation and Health: The historical discussion on ventilation and health will be presented, ending in the reasons for the standards of today, a critical review of them.
- ❖ Ventilation and Health: This talk gives an overview of the state of the art regarding the importance of ventilation for health. Do we really need ventilation, and then how much from a health point of view?
- ❖ Dampness in Buildings and Health: "Toxic" mold is popular issue in USA. But what do we know? Are we getting sick from exposure to mold? In this talk the state of the art regarding the scientific knowledge will be addressed. New results from ongoing studies in Europe will be presented. Is mold that important?
- ❖ Indoor Air Quality and Health: This talk presents an overview of most aspects IAQ and Health. What exposures are important from a health perspective?
- ❖ Indoor Air Humidity, Health and Comfort: Is air humidity of importance for health or comfort? The state of the art of knowledge is presented. Other specific topics related to indoor air and health can be addressed in specially designed lectures. A discussion beforehand is then needed.

## **TECHNICAL, ENERGY AND GOVERNMENT ACTIVITIES (TEGA)**

*By Russell J. Lieu, P.E.*

We would like to encourage all members to start thinking about the Technology and Government Activity Awards for this year. Our Chapter has received one application thus far, and we are hoping to receive several more applications by February 2006.

TEGA's role with society and the members include many areas of responsibility. One of the roles for TEGA is to create, enhance and maintain two-way communications between members and society technical activities.

The ASHRAE Technology awards program recognizes - on an international scale - successful applications of innovative design that incorporate ASHRAE standards for effective energy management, indoor air quality, and good mechanical design. The short form is available at <http://www.ashrae.org/template/AssetDetail/assetid/25447>.

According to ASHRAE, the purpose of the Government Activities award is to stimulate effective participation by ASHRAE chapters in state, provincial, and/or local government activities in connection with technical issues related to the purpose of the Society.

## **NATIONAL ENGINEERING WEEK (FEB 19-25, 2006)**

For the 4th consecutive year, ASHRAE So Cal chapter will celebrate the Engineering Week with high school students.

We will have 2 days of events located at the Edison-CTAC on Feb 24th and at the Gas Company-ERC Feb 23rd. These events have always been a great success among the students. They get tours, demonstrations, real life work experience, and speeches from successful engineers talking about the career path in engineering.

Up to 7 schools participated in past events with over 300 students participating in 4 years.

We would like to extend the invitation to any schools in Southern California. If you have any children or know any schools that could be great candidates, please email me: [k.leblanc@us-ac.com](mailto:k.leblanc@us-ac.com).

All the information about the past student's activities for the E-week are located in our Web site under student activities: [www.ashrae-socal.org](http://www.ashrae-socal.org).

To be continued...



**SOL\*AIR WORD-WHERE?****Theme: HVAC**

N	S	K	N	A	Q	H	Z	I	X	M	X	Q	D	G	I	S	E	L	S
T	A	D	A	E	D	E	P	N	F	Y	O	D	H	J	Y	C	V	D	K
S	N	O	I	T	A	L	T	I	N	E	V	M	W	G	I	I	A	A	E
R	C	E	N	O	T	O	L	M	G	L	Y	U	Y	O	A	R	P	M	E
N	O	I	T	A	C	I	F	I	D	I	M	U	H	E	D	T	O	P	E
Y	R	D	M	A	R	I	M	N	S	T	F	N	K	P	B	E	R	E	T
E	O	L	X	A	L	Z	O	O	E	I	O	R	Z	Q	X	M	A	R	R
D	N	G	C	T	N	I	D	M	I	I	V	Y	Z	W	S	O	T	S	J
C	Y	O	E	W	S	Y	P	O	T	S	R	R	Y	P	U	H	I	S	Z
Y	E	R	I	O	Y	E	D	A	M	B	T	P	R	U	B	C	V	I	J
I	S	N	R	T	R	X	R	O	Q	D	E	U	B	L	E	Y	E	S	P
P	G	R	T	A	P	E	Z	N	M	X	F	U	R	I	Z	S	Q	T	E
P	O	V	T	R	G	R	D	P	X	R	S	H	X	E	T	P	F	N	N
C	V	U	P	I	I	C	O	G	E	N	E	R	A	T	I	O	N	A	O
M	R	M	R	V	P	F	B	S	Y	A	Q	H	R	G	X	Q	U	C	Z
E	U	F	U	Z	O	Q	U	O	B	C	R	I	T	E	R	I	A	I	O
P	E	T	I	V	B	P	M	G	S	A	T	N	A	I	D	A	R	S	Y
R	M	F	J	P	X	E	E	L	A	U	O	G	S	T	M	F	B	S	D
C	F	Q	Z	K	F	C	K	X	M	L	F	L	T	J	P	S	C	E	G
M	Q	P	X	D	Y	I	B	C	E	T	Y	B	M	E	O	U	C	D	H

**15-minute challenge**

Find the words listed here in the above word search

absorption	desiccants	pump
centrifugal	evaporative	radiant
cogeneration	filters	refrigeration
corrosion	latent	temperature
criteria	moisture	thermodynamics
dampers	ozone	ventilation
dehumidification	psychometrics	

**How'd you do?**

12-16 minutes: Brighter than your average bulb

9-12 minutes: At the top of your class, no doubt

5-8 minutes: You're in the wrong trade – you should be a detective!

**See answer key, page 14.**

## SCHOLARSHIP RECIPIENTS



Cypress College students, Robert Hinson, Adam Thomas, & Andrew Sear receiving their scholarships from College President Marjorie D. Lewis and Chapter Scholarship Committee Chair, Ishtiaq A. Chisti.



### MARY JOHNSON: FIRST WOMAN PRESIDENT OF ASHRAE, SOUTHERN CALIFORNIA CHAPTER

By: Joe C. Ablay, PE, CEM

Mary Johnson, such an ordinary name. So ordinary that one could glance at that name once and be able to remember it for quite a long time. But I'm not talking just about any name; I'm talking about Mary, "the" Mary Johnson that became part of ASHRAE. The very first woman ever to be elected President in such an organization. Amazing would not be enough to describe such a remarkable person.

Throughout her career, she has been a part of ASHRAE. She became a member in 1991 through the guidance of Elbert Kelly. And during that same year, she was part of the CRC Delegate in Hawaii. She went through ASHRAE like a storm heading all sorts of committees from being a Golf Tourney Chair to being part of the Board of Directors and she went through those positions with her ever-guiding presence. But the most prestigious of them was her being elected as ASHRAE president in 1998 to 1999, the first in the history of the chapter. All were awed by her ongoing achievements in her career, but she never became self-aggrandizing. How could she ever be - after all she's just an ordinary person - just having an exceptional talent.

She is the kind of person everyone in the field would like to meet and know. "To give back to our industry," that has been her slogan all throughout her career and she has stuck to it.

She is one of only five women who graduated in 1984 from Cal Poly Pomona. She was hired that same

year by Johnson Controls as a Sales Engineer, making her the first woman ever to be hired in Sales on the entire west coast. She worked there for almost four years harnessing and honing her skills in sales. She was not just an ordinary sales engineer, but one of the best ever working in the field. That was why she was hired by Siemens in 1988 as an Account Executive. Being a great engineer she was destined to be inducted in Siemens' Sale's Hall of Fame, making her the first woman to be inducted in the Sale's Hall of Fame. Her hard work, along with her devotion, enabled her to reach her goals and set a standard among her peers.

Extraordinary Mary Johnson indeed.

## NEW RECEPTION AND ATTENDANCE CONTACTS!!!

By Karine Leblanc

As many of you may know by now, Dale Au decided to pass the baton of the reception and attendance after 3 years of commitment well accomplished. Dale did a fabulous job and we really appreciated his work as a volunteer!!!

Michelle Sangalang and Scott Gilchrist were kind enough to volunteer their time for the reception dinner reservations for every ASHRAE monthly meeting to replace Dale Au's position.

Please make sure that you email these contacts for your future reservations.

WELCOME SCOTT AND MICHELLE!!!!



### SUMMARY OF THE 2005 CHANGES TO THE CALIFORNIA ENERGY EFFICIENCY STANDARDS (PART 4)

Submitted by Clay Lampman

#### ADDITIONS, ALTERATIONS AND REPAIRS

**Additions.** When the owner chooses to show compliance for an addition by upgrading a component of the existing building to compensate for failing to meet a prescriptive requirement applicable to additions, the upgraded component will be required to meet the requirements for alterations. When ducts will be extended from an existing duct system to serve an addition, the ducts will be allowed to meet the duct sealing requirements for alterations to existing duct systems.

## ALTERATIONS

**Prescriptive Approach.** Alterations to the building envelope other than for roof replacements, recovering, or recoating, will be required to meet one or the other of the following requirements: i) when there are no changes to fenestration area, the requirements for newly constructed buildings that apply to the altered component, or ii) neither increase the overall heat gain nor increase the overall heat loss of the building envelope. An exception to option i will allow increases of less than 50 square feet of fenestration area or replacements to only a portion of the building's fenestration area to meet the requirements for newly constructed buildings, except the requirements for solar heat gain coefficient will not be required to be met.

When more than 50 percent of the exterior surface or more than 2,000 square feet of roof (whichever is less) of nonresidential low-slope roofs is replaced, recovered, or recoated, the requirements for cool roofs will apply. A tradeoff option will be established which allows other features of the building envelope to be improved to compensate for failure to meet the cool roof requirements. An exception will be established for roof recoverings allowed by the California Building Code when both the existing roof and the new roof have a rock or gravel surface, when there is no removal of existing layers of roof coverings, when there is no recoating with a liquid applied coating and when there is no installation of a recover board, rigid insulation or other rigid, smooth substrate.

When new or replacement ducts are installed to serve an existing building where the ducts are located in unconditioned or indirectly conditioned space as specified by §144(k), the duct system will be required to meet the mandatory requirements in §124 and be sealed, tested and field verified. Ducts that form entirely new duct systems will be sealed to meet the prescriptive requirements for newly constructed buildings. New ducts that extend an existing duct system will have two options: i) the measured duct leakage for the combined new and existing duct system will be less than 15 percent of fan flow, or ii) the duct leakage prior to sealing will be reduced by more than 60 percent and a visual inspection will be required to show that all accessible leaks have been sealed. It is possible that neither of the two options for extensions of existing duct systems can be achieved. If that is the case, compliance will require that a certified Home Energy Rating System (HERS) rater verifies that all accessible leaks have been sealed. Duct sealing will not be required when: an existing duct system that is extended is constructed, insulated, or sealed with asbestos.

When a space conditioning system is altered by the installation or replacement of space conditioning equipment, including replacement of an air handler, cooling or heating coil, or furnace heat exchanger, the existing duct system that is connected to that new or replaced space conditioning equipment will be required to be sealed, tested, and verified to the same requirements of new ducts that extend an existing duct system. Duct sealing will not be required when the existing duct system is altered to no longer be within the scope of §144(k); when the existing duct system is documented to have been previously sealed, tested and field verified; or when the existing duct system is constructed, insulated or sealed with asbestos.

Alterations to existing outdoor lighting systems that increase the connected load or replace more than 50 percent of the luminaries will be required to meet the lighting power allowances in §147.

New internally and externally illuminated signs installed in conjunction with alterations will be required to meet the requirements for signs in §148, as well as alterations to signs that increase the connected lighting load or replace and rewire more than 50 percent of the ballasts in existing signs or relocate the sign to a different location.

**Performance Approach.** The altered building will be required to be improved so that the building uses no more energy than an energy budget that is based on: i) compliance with the cool roof requirements for roof replacements, ii) no other changes to the existing building envelope, and iii) compliance with the prescriptive requirements for mechanical and lighting system alterations.

## STANDARDS CHANGES FOR LOW-RISE RESIDENTIAL BUILDINGS

### Mandatory Requirements

**Air Retarding Wrap.** The requirements for an infiltration barrier, which no longer apply, will be replaced by requirements for air retarding wraps, as specified in the Residential ACM Manual.

**Design Conditions.** Outdoor design conditions for equipment sizing will be required to be the 1.0 Percent Cooling Dry Bulb and Mean Coincident Wet Bulb temperatures in Joint Appendix II.

Water Piping and Cooling System Line Insulation Thickness and Conductivity.

The method for specifying water piping and cooling system line insulation requirements that has previously been used for nonresidential and high-rise residential buildings, will be applied to low-rise residential buildings while maintaining the overall stringency of the

existing low-rise residential requirements. This change will add clarity and flexibility for calculating insulation thickness for the complete range of insulation materials commonly in use. Insulation requirements will be clarified to apply to all cooling system refrigerant suction, chilled water and brine lines. To meet pipe insulation requirements in §151 (f) 8 D, or to gain credit for pipe insulation to comply with the performance standards, exceptions are established to not require pipe insulation on piping that penetrates framing members, piping installed in walls that are insulated in conformance to the Insulation Installation Quality compliance option, and in attics with a minimum of four inches of attic insulation on top of the piping.

**Residential Lighting.** The requirements for residential lighting will be substantially revised to increase clarity and specificity, require high efficacy lighting equipment or energy savings controls for permanently installed luminaires in all lighting function areas, as well as require recessed luminaires in insulated ceilings to be airtight; At least 50 percent of the lighting wattage in kitchens will be required to be high efficacy. Lighting in bathrooms, garages, laundry rooms, and utility rooms will be required to be high efficacy or controlled by a “manual on” occupant sensor. Lighting in other indoor spaces will be required to be high efficacy or be controlled by a dimmer switch. Outdoor lighting permanently mounted to a building will be required to be high efficacy or be controlled by a motion sensor with an integral photosensor. Lighting in parking lots and parking garages for eight or more vehicles will be required to meet all applicable mandatory and prescriptive requirements in other sections of the Standards that apply to such lighting. Lighting installed in the common areas of low-rise residential buildings with four or more dwelling units will be required to be high efficacy or be controlled by an occupant sensor.

## PERFORMANCE STANDARDS

**Water Heating Budgets.** The water heating budget for systems serving multiple dwelling units will be based on a central recirculating water heating system with gas water heaters and timer controls. For systems serving individual dwelling units, a single storage type gas water heater meeting the prescriptive and mandatory standards will be the basis of the energy budget. The energy budget for systems serving individual dwelling units will also be met by installation of an instantaneous gas water heater.

**Space-conditioning Budgets.** The space conditioning budgets will be changed to be based on the revised prescriptive requirements in Section 151(f) using

an approved calculation method meeting the requirements of the Residential ACM Approval Manual.

## PRESCRIPTIVE STANDARDS

**Fenestration Glazing.** Area-weighted average U-factors will be allowed to be used to comply with U-factor requirements. The U-factor requirements in Package D will be updated to match the new NFRC test procedures. The maximum fenestration area requirements in Package D will be revised to be 20 percent in all climate zones. In specific climate zones with substantial summer cooling energy use, the west-facing fenestration area in Package D will be limited to 5 percent of the conditioned floor area.

**Shading** [§151(f)4]. Area weighted average Solar Heat Gain Coefficients (SHGCs) will be allowed to be used to comply with SHGC requirements for fenestration products other than skylights. Skylights will continue to be required to comply with SHGC requirements individually.

**Water-Heating Systems.** Water heaters will be required to meet new federal appliance standards as specified in the Appliance Efficiency Regulations. For systems serving individual dwelling units, either a single gas storage type water heater, 50 gallons or smaller, with no recirculation pumps and meeting the mandatory insulation requirements for storage tanks and hot water pipes to the kitchen, or instantaneous gas water heaters will be required. For systems serving multiple dwelling units, a central recirculating water heating system with gas water heaters with timer controls will be required. Hot water pipes from the water heater to the kitchen fixtures that are 1/2 inches or greater in diameter will be required to be insulated.

**Space Conditioning Ducts.** Duct insulation requirements for Package D will be R-4.2 in climate zones 6, 7, and 8; R-6 in climate zones 1-5, and 9-13; and R-8 in climate zones 14, 15 and 16. Duct insulation requirements for Package C will be R-8 statewide.

**Prescriptive Approach.** The fenestration in additions up to 100 square feet will be required to meet the U-factor requirements in Package D.

**Performance Approach.** When the builder chooses to show compliance for an addition by upgrading a component of the existing building to compensate for failing to meet a prescriptive requirement applicable to additions, the upgraded component will be required to meet the requirements for alterations. When ducts will be extended from an existing duct system to serve an addition, the ducts will be allowed to meet the duct sealing requirements for alterations to existing duct systems.

## Alterations

**Prescriptive Approach.** Alterations that add fenestration area will be required to meet the U-factor, fenestration area, and SHGC requirements of Package D with the exception that increases of fenestration area up to 50 square feet that meet the U-factor and SHGC requirements will be allowed.

Replacement fenestration, where all the glazing in an existing fenestration opening is replaced with a new manufactured fenestration product, will be required to meet the U-factor and SHGC requirements of Package D. Glass replaced in an existing sash and frame and replacement of a single sash in a multi-sash fenestration product are considered repairs, which are not required to comply.

When more than 40 feet of new or replacement space conditioning ducts are installed to serve an existing building, the new ducts will be required to meet the mandatory requirements in §150 (m) and the duct insulation requirements in Package D, and in climate zones 2 and 9-18 the combined new and existing duct system will be required to be sealed, tested, and field verified. Ducts that form entirely new duct systems will be sealed to meet the prescriptive requirements for newly constructed buildings. New ducts that extend an existing duct system will have three options: i) the measured duct leakage for the combined new and existing duct system will be less than 15 percent of fan flow; ii) the duct leakage to outside will be less than 10 percent of fan flow; or iii) the duct leakage prior to sealing will be reduced by more than 60 percent and a visual inspection and smoke test will be required to show that all accessible leaks have been sealed. It is possible that none of the three options for extensions of existing duct systems can be achieved. If that is the case, compliance will require that a certified HERS rater verifies through observation and a smoke test that all accessible leaks have been sealed. Duct sealing will not be required when an existing duct system that is extended is constructed, insulated, or sealed with asbestos.

When a space conditioning system is altered by the installation or replacement of space conditioning equipment, including replacement of an air handler, cooling or heating coil, or furnace heat exchanger, the existing duct system that is connected to that new or replaced space conditioning equipment will be required to be sealed, tested and verified to the same requirements of new ducts that extend an existing duct system. Duct sealing will not be required when the existing duct system is documented to have been previously been sealed, tested and field verified; when the existing duct system is less than 40 linear feet in unconditioned spaces

or when the existing duct system is constructed, insulated or sealed with asbestos.

**Performance Approach.** The altered building will be required to be improved so that the building uses no more energy than an energy budget based on an unchanged existing building except that those altered components that do not meet the prescriptive alteration requirements are upgraded to meet those requirements. When an altered component does meet the prescriptive alteration requirements, the energy budget will be based on the existing building without that altered component

## PART 1, CHAPTER 10-ADMINISTRATIVE REGULATIONS CHANGES

**Application for a Building Permit.** Plans and specifications submitted with an application for a building permit for nonresidential buildings, high-rise residential buildings, and hotels and motels will be required to include acceptance requirements where required in Part 6.

Within 90 days after the enforcement agency issues a final permit, record drawings will be required to be provided to the building owner.

**Certificate of Acceptance.** A Certificate of Acceptance will be required to be filed with and approved by the enforcement agency prior to receiving a final occupancy permit. The Certificate of Acceptance will indicate that the applicant has demonstrated acceptance requirements in the plans and specifications, that current requirements for installation certificates are met, and that currently required operating and maintenance information (as well as the Certificate of Acceptance) were provided to the building owner.

**Enforcement Agency Requirements.** The enforcement agency inspection requirements will be revised for buildings, which have used a compliance option that requires field verification and diagnostic testing, to require the building department to not approve the building until the building department has received a Certificate of Field Verification and Diagnostic Testing that has been signed and dated by the Home Energy Rating System (HERS) rater.

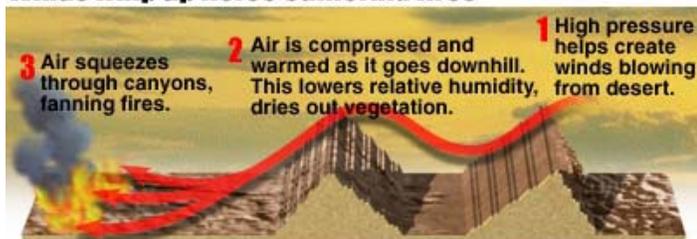
## SHOOTING THE BREEZE

### Mountains help create hot, dry Santa Ana winds

By Chad Palmer, USATODAY.com

Several meteorological factors come together to create the hot, dry Santa Ana winds that often whip up roaring fires in southern California.

## Winds whip up fierce California fires



Source: USA TODAY research

The factors needed to stir up Santa Ana winds begin with an area of high air pressure to the north and east of Southern California. (Related graphic: High air pressure)

Winds blow clockwise around high pressure in the Northern Hemisphere, which means that winds on the southern side of the high-pressure area blow from the east toward the Pacific Ocean, toward lower air pressure off shore.

The easterly winds push air from over the inland deserts of California and the Southwest, which means the air starts out dry.

The winds blow over the mountains between coastal California - such as the Los Angeles Basin - and the deserts. As the wind comes down the mountains, it is compressed and warms up.

As the air warms, its relative humidity drops, sometimes to less than 20% or even less than 10%. (Related item: Understanding)

The extremely low humidity helps dry out vegetation, making it a better fuel for fires.

As the winds squeeze through canyons and valleys they speed up, fanning flames. In addition, as the winds whip over mountains and squeeze through canyons, friction helps create eddies, or swirling winds. As these come and go, the air can become almost still and then quickly speed up in gusts.

The winds are like water rushing down a very rough white-water stream, creating eddies that come and go. These gusty winds can change direction quickly, sending flames racing into new areas

Fires also affect the winds. Fire warms the air, causing it to rise. As this happens, more air rushes into to replace the rising air, helping create more gusts from various directions.

Find this article at:

<http://www.usatoday.com/weather/wsanta.htm>.

## TIMES ARE A CHANGIN'

Submitted by: Sol\*Air Editors

Q: Daylight-savings time

Several weeks ago I was told you ran a story that we were not going to have daylight-saving time any more. I don't know how I've missed this and I've not heard anything on the news. Can you please explain?

- K. Crow, Redondo Beach

You've been misinformed. Daylight-saving time has not been eliminated. In fact, it will soon be extended longer each year.

A provision of the energy bill passed by Congress and signed by President Bush this year extended daylight-saving time another month starting in 2007. Under the new law, daylight-saving time will begin three weeks earlier in the spring and end a week later in the fall.

In 2007, daylight saving time will begin March 11 (instead of the first Sunday in April) and end Nov. 4<sup>th</sup> (instead of the last Sunday in October), according to the U.S. Naval Observatory.

The Daily Breeze, September 29, 2005

## ASHRAE SATELLITE BROADCAST/WEBCAST

Submitted by Kim Brown

The official webpage for the ASHRAE "Sustainability and the Building Environment" Satellite Broadcast/Webcast (scheduled for April 19, 2006) is available at

<http://www.ashrae.org/greenbuildingsbroadcast>. The webpage features information regarding the broadcast presenters and moderator, frequently asked questions, on-line registration dates, the tentative broadcast agenda, and ASHRAE "Green" publications, courses, and Distinguished Lecturers.

Please take a few minutes to review this information, add the link to your Internet favorites, and email it to your colleagues.

If you have comments or questions, please contact Rosy Douglas at [rdouglas@ashrae.org](mailto:rdouglas@ashrae.org) or call (678) 539-1128.

Rosy Douglas, ASHRAE Chapter Support Manager  
1791 Tullie Circle, N.E., Atlanta, GA 30329-2305  
Tel: 678-539-1128 / Fax: 678-539-2128

## ASHRAE IMPLEMENTS NEW PROCESS TO UPDATE CODE-INTENDED STANDARDS

Submitted by Jodi Dunlop

As part of ongoing efforts to increase use of its standards, the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) has announced a major change to the availability of addenda to code-intended standards.

The move puts ASHRAE in line with issuance of model building codes.

In the past, addenda for code-intended standards on continuous maintenance were posted individually on ASHRAE.org after being approved by the Board of Directors for publication. Now, Board-approved addenda to code-intended standards will be published in a supplement. The supplements for each standard will be published in a supplement. The supplements for each standard will be published on a regular schedule halfway between the three year publication of each standard. The addenda also will be incorporated into each standard when it is reissued after its last publication.

Richard Hermans, P.E., chair of ASHRAE's Standards Committee, acknowledges the change as significant.

"Our whole approach to how we relate to the building code industry is changing," Hermans said. "We are seeking more involvement with the model code development community to assist us in our code proposals. We are responding to member concerns over the cost of keeping up with our code-intended standards. By cost, I am not referring to the dollars spent for obtaining the updated documents but rather the cost in time to train employees about the new requirements contained in addenda. And we are aligning our release of certain standards to coincide with model code schedules for code change proposals."

All of these actions point to a policy of releasing addenda on a predictable schedule spaced out over years, he said. "In this way, we will develop our code-intended standards in the same way that groups such as the International Code Council and the National Fire Protection Association, both of which incorporate ASHRAE standards, maintain their model codes," he said.

The change applies only to code-intended standards that are on continuous maintenance. These are:

- ❖ Standard 15, Safety Standard for Refrigeration Systems;
- ❖ Standard 34, Designation and Safety Classification of Refrigerants;

- ❖ Standard 52.2, Method of Testing General Ventilation Air Cleaning Devices for Removal Efficiency by Particle Size;
- ❖ Standard 62.1, Ventilation and Acceptable Indoor Air Quality in Commercial, Institutional, Industrial and High-Rise Residential Buildings;
- ❖ Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings;
- ❖ Standard 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings;
- ❖ Standard 90.2, Energy Efficient Design of Low-Rise Residential Buildings;
- ❖ Standard 140, Standard Method of Test for the Evaluation of Building Energy Analysis Computer Programs.

The first supplements for standards published will be available in March 2006.

For more information on ASHRAE's work in standards, visit [www.ashrae.org/standards](http://www.ashrae.org/standards).

ASHRAE, founded in 1894, is an international organization of 55,000 persons. Its sole objective is to advance through research, standards writing, publishing and continuing education the arts and sciences of heating, ventilation, air conditioning and refrigeration to serve the evolving needs of the public.

## 2004-2005 CHAPTER OFFICERS AND DIRECTORS

**DIRECTOR..... Joe Ablay**

909-843-6317

E-mail: [jablay@integratedengineers.com](mailto:jablay@integratedengineers.com)

**DIRECTOR.....Karine Leblanc**

626-854-4611 / E-mail: [k.leblanc@us-ac.com](mailto:k.leblanc@us-ac.com)

**DIRECTOR..... Russell Lieu**

S626-633-7102 / e-mail: [lieurj@sce.com](mailto:lieurj@sce.com)

**DIRECTOR..... Carmen Urenda**

626-854-4500 / E-mail: [c.urenda@us-ac.com](mailto:c.urenda@us-ac.com)

**DIRECTOR/PAST PRESIDENT..... Don La Marr**

626-913-7123 / E-mail: [drlamarr@trane.com](mailto:drlamarr@trane.com)

**AUDIT, BUDGET & FINANCE ..... Phil Trafton**

818-385-3600 / Email: [pmtrafton@dfdall.com](mailto:pmtrafton@dfdall.com)

**CHAP. COMMITTEES ATTENDANCE & RECEPTION****Michelle Sangalang / Scott Gilchrist**

626-854-4613, m.sangalang@us-ac.com

626-854-4612, s.gilchrist@us-ac.com

**CHAPTER WEB SITE..... Karine Leblanc**

626-854-4611 / E-mail: k.leblanc@us-ac.com

**CRC DELEGATE..... David Kuo**

626-854-6801 / E-mail: d.kuo@us-ac.com

**CRC ALTERNATE .....Narendra Amarnani**

323-267-2441 / E-mail: namarnani@isd.co.la.ca.us

**GOLF TOURNAMENTS.....Joe Ablay**

909-843-6317

E-mail: jablay@integrated-consultants.com

**ENGINEER'S WEEK ..... Karine Leblanc**

626-854-6801 / E-mail: k.Leblanc@us-ac.com

**ENGINEER'S WEEK ..... Randall Higa**

213-244-3661 / E-mail: rhiga@semprautilities.com

**HONORS & AWARDS .....Don La Marr**

626-913-7123 / E-mail: drlamarr@trane.com

**INSTALLATION & AWARDS ..... David Kuo**

626-854-6801 / E-mail: d.kuo@us-ac.com

**MEMBERSHIP PROMOTION****& SERVICES..... Ralph Panting**

562-694-8543 / E-mail: rpanting@acspecialties.com

**PAOE POINTS STATUS .....Cindy Callaway**

562-497-2999 / E-mail: cindy.callaway@p2seng.com

**PROGRAMS ..... David Kuo**

626-854-6801 / E-mail: d.kuo@us-ac.com

**PUBLIC RELATIONS LIAISON ..... Chad Herrick**

562-944-6341 / E-mail: cherrick@wasocal.com

**RAFFLE COMMITTEE..... Karine Leblanc**

626-854-4611 / k.leblanc@us-ac.com

**RESEARCH PROMOTION.....Peter Simmonds**

818-377-8220 / E-mail: peter.simmonds@ibece.net

**SCHOLARSHIP INVESTMENT .....Phil Trafton**

818-385-3600 / E-mail: pmtrafton@dfda1.com

**SOL\*AIR Editors ..... Sharon McKeown / Susan Wells**

562-944-6341 / email: smckeown@wasocal.com

562-944-6341 /email: swells@wasocal.com

**SPRING TECHNICAL SEMINAR .. Carmen Urenda**

626-854-4500 / E-mail: c.urenda@us-ac.com

**STUDENT ACTIVITIES.....Karine Leblanc**

626-854-4611 / E-mail: k.leblanc@us-ac.com

**ROSTER PRODUCT DIRECTORY. Mike Gallagher**

562-944-6341 / E-mail: mgallagher@wasocal.com

**SCHOLARSHIP COMMITTEE .....Clay Lampman**

626-355-8979 / E-mail: cala\_eng@earthlink.net

**TECHNICAL, ENERGY & GOVERNMENT****AFFAIRS (TEGA) ..... Russell Lieu**

626-633-7102 / E-mail: lieu@scce.com

**SOUTHERN CALIFORNIA CHAPTER PROGRAM SCHEDULE****December 6, 2005: Past President's Night**

Joint Meeting Hosted by: Orange Empire

Program Chair: Darren Smith, dsmith@accoes.com

Main Program: History of Ventilation and Health

Speaker: Jan Sundell, Technical University of Denmark (ASHRAE DL)

Location: ERC in Downey

**January 10, 2006: Research Night**Tech Program: Principles of Engineering Economics/  
System Feasibility / LCC Analysis

Speaker: Ed Clancy, Cal Poly Pomona

Main Program: Tour of UCLA Cogeneration Facility

Speaker: Lucas Hyman, Goss Engineering

Location: UCLA

**February 7, 2006: Membership Night**Tech Program: Good-Bye Division 15: The New &  
Improved CSI Specification Format

Speaker: Michael Chusid, Chusid Associates

Main Program: Value Engineering, Cost Estimating -  
Owners Perspective

Speaker: Timothy Ball, CSU Long Beach

**March 7, 2006: QC Night**Tech Program: Commissioning Process. Developing  
Cx Plan

Speaker: David Ellner, TRC-EASI

Main Program: Tools, Implementation Strategies,  
Primary Variable Flow Case StudySpeakers: Scott Duncan, Retrofit Originality  
Inc. and Craig Hofferber, H&P

**April 4, 2006: Refrigeration Night**

Tech Program: Tour of Miller Brewing Company plant in Irwindale with a focus on refrigeration system

Speaker: Allan Spear

Main Program: Energy Efficiency Update & Electricity Supply Demand Outlook

Speakers: Gary Green, SCE  
David Bruder, SCE

Location: SCE CTAC in Irwindale. Tour scheduled for 4:30 pm to 6:00 pm

**May 2, 2006: Student Night**

Tech Program: Showcase of successful Savings By Design energy efficient projects - local mechanical engineers panel

Speakers: Janith Johnson, SCE  
Peter Simmonds, IBE Engineers  
Eric Shamp, HMC Group

Main Program: Student Senior Project Poster Board Session and Presentation

Speakers: Jesse Maddren (Cal Poly SLO) and Students

**June 2006**

Installation Dinner/Dance

**HELP WANTED**

If you are interested in placing an ad in this column for an engineering or other position, please submit your request to:

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Please make a donation of \$50 per ad made payable to: ASHRAE Southern California Chapter.

**Director of Engineering**

San Diego-based Mechanical Engineering firm specializing in HVAC, Plumbing and Cogeneration, is searching for an experienced Professional Engineer to lead the Engineering Department.

This position will oversee and manage the flow of work generated by the Team Leaders, Project Managers, Project Engineers and Designers from project inception to its final completion, with emphasis on maintaining a high quality product while providing superior client satisfaction.

**RESPONSIBILITIES**

The Director of Engineering's responsibilities will include but not be limited to the following areas:

- ❖ The establishment and implementation of Standard Engineering Practices to include the engineering and quality assurance process and procedures.
- ❖ Oversee the updating of the current design standards and CAD standards and develop ongoing maintenance policies and procedures for each.
- ❖ Assign, coordinate and schedule all incoming projects, to the team that is best suited for each project, considering project scope, deadlines/due dates, project intensity and type.
- ❖ All aspects of project management and design efforts on projects that are personally engineered and designed by himself/herself.
- ❖ Performance and salary reviews of Team Leaders. Review and make recommendations on performance and salary reviews prepared by Team leaders for their respective Project Managers, Project Engineers and Designers.
- ❖ Assistance with proposal preparation, coordination and review with Director of Sales and Marketing.
- ❖ Perform project quality assurance reviews on projects prior to construction.
- ❖ Direct interview selection process in hiring of new Project Managers, Designers, Project Engineers and Interns.

Additional attributes sought will include strong writing skills, with the capability to produce significant reports and studies, perform data analyses, and communicate effectively with clients, equipment vendors, construction contractors, etc.

Individual must have a minimum of 15 years experience, be detail oriented and possess the ability to see projects through to completion. Salary and benefits are commensurate with experience. Location of work is primarily in San Diego, CA. Please forward resume and salary history to H/R Department Walsh Engineers 5471 Kearny Villa Road Suite 300, San Diego, CA 92123, or e-mail using MS Word format to rivko@walshengineers.com.

**Licensed Mechanical Engineer**

San Diego-based Mechanical Engineering firm specializing in HVAC, Plumbing and Cogeneration, is searching for a PE experienced in the following disciplines, for expansion of its Power Generation and Cogeneration division. Individual must have a minimum

of 10 years experience, be detail oriented and possess the ability to see projects through to completion.

- ❖ Proven Capabilities in the Production of Plans & Specifications for plants in the range of 1 – 30 MW;
- ❖ Process Design: Steam & HTW, fuel supply systems, chilled water and cooling water systems;
- ❖ Piping Design: Sizing, support, flexibility and stress analysis;
- ❖ Prime Mover & Heat Recovery Equipment Selection;
- ❖ Plant General Arrangement;
- ❖ Economic Modeling; Feasibility and Optimization Studies;
- ❖ Instrumentation & Controls: Control valve & actuation selection, instrumentation selection and specification; development of written sequences of operation;
- ❖ Ancillary Systems Design and Equipment Selection;
- ❖ Start-Up, Commissioning and Troubleshooting Activities.

Additional attributes sought include strong writing skills, with the capability to produce significant reports and studies, perform data analyses, and communicate effectively with equipment vendors, construction contractors, etc. The candidate must have the ability to conceptualize and create small to medium-sized generation plants, including equipment arrangements, piping runs, P&ID's, etc., while working in conjunction with equipment vendors, end users and construction contractors.

*Narrative describing typical activities:*

Typically, this senior-level mechanical engineer would have some involvement with, perhaps, three projects simultaneously: One in design, one in construction and one in start-up/commissioning.

At least 60-70% of the engineer's time would be focused on design tasks: Developing general arrangement plans, process design, equipment selection, piping design, I&C, detailed piping drawings, etc. He would be supported by other (junior) engineers, designers and CAD drafters from an existing pool of personnel. Projects which are in construction will generally require engineering support from this individual. This may include site visits, construction meeting, formally responding to field questions which may arise, quickly developing "work-arounds" or design modifications to suit field conditions, etc. The above activities may comprise 20-30% of the engineer's time. Start-up and commissioning activities may involve approximately 10% of the engineer's time. This effort

may be comprised of field supervision, developing testing sequences, check lists, documentation packages and working closely with the commissioning staff, vendor representatives and operators during the start-up phase. The projects are generally located in Southern California, resulting in mostly day-trips, with an occasional extended stay of 2-3 days.

Most of the engineer's work is related to design tasks. The results of this work effort are plans (drawing packages), specifications and procurement packages related to a specific project. To ultimately produce final construction drawings, the engineer will start with thermal analysis, process design, equipment selection, etc., and then generate detailed sketches or preliminary drawings. These, in turn, are given to designers and CAD drafters who will further their development towards construction drawings. However, the engineer will be responsible for reviewing, correcting, amending, and approving the drawings until the construction set is complete. During this process, he will be communicating and coordinating his design with other engineering disciplines (electrical, structural, etc.) and equipment vendors to insure the final drawing package is complete and constructible. In this regard, the ability of communicate effectively with design and

CAD staff, as well as peers in other disciplines is vitally important.

Salary and benefits are commensurate with experience. Location of work is in San Diego, CA. Please forward resume and salary history to H/R Department Walsh Engineers 5471 Kearny Villa Road Suite 300, San Diego, CA 92123, or e-mail using MS Word format to rivko@walshengineers.com.

**SOL\*AIR WORD-WHERE? SOLUTION**

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Certified Test & Balance Technician  
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**LOS ANGELES AIR BALANCE Co., Inc.**



**Vince Alejandre**  
Mechanical Engineer



1848 W. 11th Street, Unit #N Upland, CA 91786  
Tel: 909-931-1114 Fax: 909-931-4840

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**Phillip M. Trafton, CPD, LEED AP**  
Principal

(818) 385.3600  
(310) 277.1865  
FAX (818) 990.1669  
pmtrafton@dtda1.com

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**Charlie Ioimo**  
Vice President  
cioimo@eberhardco.com

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