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For ASHRAE news and society  
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[ashrae.org/about/news](http://ashrae.org/about/news)

## MAY MEETING

Tuesday, May 3, 2022 5:30 PM - 9:00 PM

**Theme: Student Night**

**Presentation:** Student Presentation and Scholarship

**Presenters:**

Student Presenters



**COST: Chapter Members/Non-Members**

**Meeting Cost:**

Early Bird \$45/\$55 | 24 Hrs Before \$55/\$65  
Students are free!

**LOCATION:**

Quiet Cannon Conference & Event Center  
901 Via San Clemente  
Montebello, CA 90640

## UPCOMING EVENTS



ASHRAE  
INSTALLATION  
DINNER

JUNE  
18  
2022

SOFI STADIUM  
6-10PM



The Southern California Chapter of ASHRAE presents the



Eighth Bi-annual Edward Schmidt  
Memorial Scholarship  
Golf Tournament

Monday May 9th, 2022 - 1:00 Shotgun Start

SAVE  
THE  
DATE

# Student Night



## STUDENT NIGHT

May 3rd, 2022  
Quiet Cannon  
901 Via San Clemente,  
Montebello CA 90640

- Scholarships Awarded
- Student Presentations by Cal Poly Pomona and Cal Poly SLO
- Local Student Chapters



Come Support our  
Student Chapters!

# President's Message

So, this is our last program meeting of our chapter year. Those of you who remember the Carol Burnett Show might remember the way she would close the evening program, with a slight tug on her ear, singing a familiar closing tune, while staring wistfully into the camera as if to say, "Dang it, I wish we could just keep on going!"



I suppose that's how I and your chapter volunteers must feel just now. There were so many things we wanted to do when we started in July of last year, and I don't just mean trying to stay out of the hospital. And, while we may not have hit every one of our targets, I think we can be awfully proud of the accomplishments of this past year:

...Produced a successful Joint Chapters program meeting with our OC & IE chapter partners,

...Created well received and well attended program meetings covering technical topics such as a Controls panel, a virtual presentation on the Future of Refrigerants, and in in-depth discussion of Decarbonization with two titans of our industry,

...Nearly doubled our scholarships by awarding \$50,000 to a total of 20 deserving students

So, this Tuesday night, as our student chapters present some student HAVC projects, and we meet to honor our student scholarship winners, look around the room and know that many of those present volunteered countless hours to help promote our industry as a way of giving back to those who provided our first leg up, introducing us to technology at the forefront of the climate battle.

Thank you all. It's been swell.

Dang. I wish we could just keep going.

Barnabas Path, President  
ASHRAE SOCAL, 2021-22

# Student Scholarships

## 4-Year Engineering College/University

Brad Biscocho	CP SLO	\$ 5,000	
Ejmin Boghonian	CP Pomona	\$ 3,000	
Aimee Chiem	CP SLO	\$ 2,500	
Kevin Edwards	CP SLO	\$ 2,500	
James Johnson	CP Pomona	\$ 2,000	
Zach McCune	CP Pomona	\$ 4,000	Frank Park Award
Erin Moss	CP SLO	\$ 6,000	Ed Schmidt Award
Isaac Noriega	CP Pomona	\$ 2,000	
Cedric Rebullar	CP Pomona	\$ 2,000	
Alexander Rosales	CP Pomona	\$ 2,000	
Wade Sun	CP Pomona	\$ 2,000	
Nami Suzuki	CP SLO	\$ 2,000	
Duke Lin	CP Pomona	\$ 2,000	

## 2-Year Community College

Angel Macias	Cypress	\$ 1,500	
Jonathan Maldonado	Cypress	\$ 1,500	
Kenny Monica	Cypress	\$ 1,500	
Amanda Valles	Cypress	\$ 1,500	
Jose Zavaleta	Cypress	\$ 1,500	
John Cobian	Cypress	\$ 1,500	

## High School Graduating Student Accepted to 4-Year Engineering Program

Andrew Williams	Multiple Acceptances	\$ 2,000	John Tamney Award
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# Mike's Monthly Maintenance

by Mike Gallagher, [MGallagher@wasocal.com](mailto:MGallagher@wasocal.com)

## Practical Electrical Issues for the Mechanical Designer

Last month we discussed a variety of electrical considerations that a mechanical engineer needs to know in HVAC. This month finishes the topic. Please feel free to look on the SoCal Chapter's website under the archived newsletters to see last month's column.

208/3/60 vs 230/3/60 electrical service. Rather than go into star and delta electrical distribution and the related 208 or 230 volt power available from a 460 volt service, I'm going to focus on the really key thing for mechanical folks. When using a piece of equipment in a 230 volt application, you can believe that the pump, fan or cooling tower/fluid cooler sales rep probably knows what they are doing and can get you the right selection. If the electrical service is 208 volts, you cannot (*cannot*) trust that they know what they are doing. Motors for 208/3/60 applications need to be 200/3/60, NOT "230/3/60, rated to be run at 208 volts". Why? Because a 10% leeway is allowed to the power company. So a 230 volt motor can operate on a sustained basis at  $230 - 10\% = 207$  volts. At first glance, this may seem OK for a 208 volt motor. But...and here is where your knowledge of reality is important...power companies have limitations. Their power supply may be limited, and their distribution network may be limited. The result is that, during peak power draw periods, their delivered voltage can drop below the nominal voltage. As examples, I've repeatedly seen 208/3/60 systems routinely running at 194 volts in parts of both San Pedro (DWP) and Montebello (SCE) during Brown Out and near Brown Out conditions on a hot summer afternoon. A 230 volt motor will not stay on line under these conditions, and will suffer life-shortening heat until they trip off. A 200 volt motor is permitted to operate down to  $208 - 10\% = 187$  volts. Getting the right motor for your fan, pump, fluid cooler circulating pump, air handling unit and other application is important. 208

volt service is NOT the same as 230 volt service! And 230 volt motors rated to be run at 208 volts are NOT the same as 200 volt motors!

While on this subject, let's clarify the meaning of "service factor" as it applies to motors (and boy, you can find some erroneous explanations on the internet). Motor Service Factor (SF) is the percentage of overloading the motor can handle for short periods when operating normally within the correct voltage tolerances. This is practical as it gives you some slop factor in estimating peak horsepower needs and actual running horsepower requirements. However...and this is a big deal...continuous operation in the service factor will reduce motor life. Consequently, service factor is really intended to handle brief, "peak" loads. *It is not intended to provide a continuous extension of motor size or capacity.*

A logical "follow up" to the above is amp draw of the motor at part load. Brake horsepower (BHP) is the actual load drawn by the motor. Rated motor horsepower (HP) is what the motor is capable of delivering on a continuous basis. The amp draw at full HP is shown on the motor nameplate. The actual amp draw is NOT proportional to the BHP/HP. Why? Because the amp draw formula is:  $\text{Amp draw} = \text{voltage} \times 746 / (\text{BHP} \times \text{efficiency} \times \text{power factor})$ . Efficiency drops somewhat at part load. Power factor drops a whole bunch at part load. Neither deteriorates in a linear manner. You can Google typical curves for both motor efficiency and power factor at part load, and that can help to estimate each at various part load points. But...and this is the point to understand...the drop off in both efficiency & power factor mean that if a motor is running at half of its nameplate amps, it is probably less than 25% of its rated HP. My rule of thumb is that if the motor is more

# Mike's Monthly Maintenance (cont...)

than 75% loaded, you can kinda sorta guesstimate the BHP as proportionate from the amp draw. Below that, and you are throwing a dart at the wall.

277 volts. I spend only a moment on this because it is such a poor idea to run equipment (typically water source heat pumps) on 277 volts that I can only urge you to say, NO!! It seems like every year in greater LA there is a building engineer electrocuted while changing a lighting ballast. Always a 277 volt ballast. Why? Because the 4 wires present in a 277 volt wiring scheme require a level of electrical understanding beyond what most building engineers (and lower level HVAC technicians) possess. It is my opinion that the use of 277 volt service for HVAC usage is a very poor practice. Yes, it is a bit cheaper to use 277v for the WSHP's if the existing lighting is 277v. But it is a bad idea for HVAC. ***Please resist the urge.***

Disconnects. Never miss the opportunity to make a service disconnect a fused disconnect. My experience has been that the fuses blow something like 3 times more often than the breaker trips, assuming they are the same size. Why? I have no idea. But the protection to the equipment is clearly more immediate. My advice? Use a fused disconnect any time you are providing a service disconnect. I'd have to think hard to come up with an instance when a non-fused disconnect makes sense....maybe if the circuit breaker is almost within reach. Otherwise, fused disconnects make sense and cost almost nothing more.

Variable Speed Drives. Remember this, if you remember nothing else from this column. Heat is what kills VSD's. Not power fluctuations (the VSD will protect itself, to the point that the nuisance trips become maddening). Heat comes from one of two (one maintenance related, one design related) sources, or sometimes both. The maintenance related item is dust. Remember that VSD's have one or two "muffin fans" that draw air through a low efficiency, washable filter to remove heat. There is going to be dust in that air. Let enough dust build up in the VSD (dust is a great insulator) and the drive will overheat when fully loaded, regardless of ambient temperature. The design related issue is location. Never locate a VSD in a non-conditioned room. And never locate a VSD outdoors, facing south or west. Why not? Because the peak solar heat load on the panel will coincide with

the highest ambient temperatures. Obviously, a north face is best since the sun will never directly shine on the VSD. East is generally OK, because the ambient temperature is generally somewhat low when the sun is shining on the VSD. South and West (and especially Southwest) are brutal from a heat standpoint inside an outdoor VSD panel. The combination of sun exposure and a small amount of dust is death to a VSD. Just don't do it. If the cooling tower, fluid cooler or other piece of equipment comes with a factory mounted VSD, look at its location before locating the tower or fluid cooler. When I replace a VSD that fried in a poorly conceived installation, I usually also relocate it so that it does not face south or west. Save the client this cost; get it right in the first place.

Electrical Ground. No discussion of VSD's is complete without talking about a good electrical ground. There was a time 10-20 years ago when it seemed that every existing piece of HVAC air moving equipment of any size was retrofitted with a VSD. It was common for the ignorant to simply ground the drive to the piece of equipment, assuming it to be fully grounded to earth. Of course, that wasn't always the case. And inevitably the installation would have no end of intermittent (and frustrating to diagnose) trip-offs. The solution was often to run a ground wire to a legitimately grounded surface. I've lost count of how many times I've seen this; it is way more than 20. Any time that a situation looks sketchy to you, it makes sense for a qualified electrician to check the ground, and that is especially important for the retrofit addition of VSD's to rooftop equipment.

Shaft Grounding Devices. Again, while talking about VSD's, we should discuss shaft grounding on motors. Bear in mind that a big electrical field with a lot of potential energy is formed around the rotor (shaft). This energy field wants to go to ground, and if there are any weak points in the insulation, small amounts of current will travel through the bearings to get there. VSD's greatly amplify this occurrence; potential energy spikes can be brutal. Arcing can occur between the bearings and the bearing race, and the pattern on the ball bearings (a chevron shaped pattern) is distinctive. The bearings fail after enough arcing mars their surface. This is avoided with a shaft grounding device, which gives the small amount of current an easier path and saves the bearings. My advice is to require shaft

# Mike's Monthly Maintenance (cont...)

grounding on any VSD powered motor.

Low voltage. Transformers to produce 24 volt power for controls should be a simple subject, but as you might expect, it isn't. 25-35 years ago it was common to have a small (20 va) transformer for every individual VAV box or fan coil that was controlled. Today, we group 10-20 units on a common control transformer circuit. The transformer itself has load side protection...usually a circuit breaker. It is on a separate circuit, located somewhere convenient, and the power is circuited in a loop from the transformer to all the terminals that are served. Because it is wired in a loop, a break at some point along the way (the cable, security & fire protection wiring folks are notorious for this) will not interrupt power to the devices. Of course, a second break will isolate some devices, so at that point we have to go hunting for the line break. A good rule of thumb is to size the low voltage wiring one size larger than the minimum acceptable, both to minimize voltage drop and to allow future flexibility for added devices.

HACR breaker. A HACR (heating, air conditioning & refrigeration) circuit breaker is an old term that referred to a time delay circuit breaker that could typically absorb 125% of rated amp draw for a period of time without tripping. Today the electrical industry simply uses a time delay circuit breaker. All of this stems from a compressor's tendency to draw more than peak power briefly while the initial mass of the compressor is moved from a static condition to dynamic motion. The concept is the same today as it has always been, but I've had more than one electrical engineer look down his nose when I used the HACR breaker term. I guess it is yet another cost of getting old....

I am always happy to hear from you with comments or thoughts....[mgallagher@wasocal.com](mailto:mgallagher@wasocal.com)

# Sustainability Committee



## *News bulletin on the HVAC Design Course:*

ASHRAE member James Lafond and past Sustainability Chair Amanda Khury from P2S Inc. are in the middle of a semester long course with 42 students from Cal Poly Pomona and Cal State LA. This 12 week HVAC design course is introducing students to load calculations using Trace 3D Plus, duct design in Revit, compiling construction documents, energy modeling, PV sizing and design, and cost analysis. The students are working in teams of 5 to design a custom air handling unit system with VAV boxes for a 2 story classroom building. Meetings are held every other Friday, where a presentation on a new topic is introduced. This course is about a 2-3 hour commitment each week for the students, and does not interfere with school work. This course gives the opportunity for students to learn about the HVAC industry, where this class would normally be a technical elective in their curriculum. Aside from the hands on learning they are getting from our course, the students are also gaining a mentorship opportunity with fellow ASHRAE Engineers and gaining real world work experience.

This course was started last year by the past ASHRAE SoCal Sustainability Committee Chair, Marcos Avila, and at the request of the students, James and Amanda decided to restart the program. The students are from the ASHRAE clubs at Cal Poly Pomona and Cal State LA, as well as a club called Alternative Renewable Sustainable Energy Club (ARSEC) at Cal Poly Pomona.

Shoutout to the Student Chapter Presidents at the following clubs for encouraging their team members to get involved in this unique learning opportunity.

ASHRAE President Cal Poly Pomona - Kevin T. Le  
ASHRAE President Cal State LA - Chris Tanakaya  
ARSEC President Cal Poly Pomona - Justin Orton



# Government Affairs Updates

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## SEC Proposes Climate Disclosure Rule

On March 21, the U.S. Securities and Exchange Commission (SEC) proposed rule amendments that would require all publicly traded companies to disclose their greenhouse gas emissions, climate-related risks and their impacts on the company's business, and information about climate-related targets and goals including any transition plans. This proposed rule was approved by the SEC on a 3-1 ruling by the SEC commissioners. The rule covers emissions generated at a company's facilities (Scope 1 emissions), as well as indirect emissions from purchased electricity or other forms of energy (Scope 2 emissions). In addition, upstream or downstream emissions generated by suppliers or customers (Scope 3 emission) would need to be reported if those emissions are "material" to investors or included in the company's climate targets. The purchase of carbon offsets would also need to be included. Emission figures would need to be audited such that data are consistent and comparable across businesses. Reporting would be phased in over time, with the largest firms needing to submit reports in 2023. Comments on the rule should be submitted by May 20, with instructions found [here](#).

More information about the rule can be found [here](#).

## Proposed California Bill Would Adopt ASHRAE Standard 188 on Legionella Prevention

A recently proposed bill in the California Senate, SB 1144, would require water efficiency and quality assessment reports for certain state agency buildings and public school buildings. Adherence to the most recent edition of ASHRAE [\*Standard 188, Legionellosis: Risk Management for Building Water Systems\*](#), is included in the proposed requirements for these reports. The bill proposes that any potable water systems, water features, or cooling towers in buildings covered by these requirements that are not in compliance with the most recent edition of ASHRAE Standard 188, American Society of Sanitary Engineering (ASSE) standards, or other applicable standards, must be remediated to meet those standards. The bill passed through the Senate Committee on Environmental Quality on April 5 and will be considered by the Committee on Education in a hearing on April 27.

# Online Donation to ASHRAE Research Promotion

## Resource Promotion Chair for SoCal Chapter

100% of this money will go to research, meaning not only you are helping creating jobs for some people ( those who actually do the research projects ) you are also helping advancement of our industry and helping green engineers such as myself learn faster and have better, more reliable resources. And for that we thank you!

You can make your contribution by:

- Going online and following instructions below ( will take 2 mins !)
- Call me and give me your information and I will do it for you
- Send a check directly to headquarter
- Send a check to me
- Ask me to come pick your check up
- Or anything else you are comfortable with, be creative!

Thank you all and see you soon.

### Online Contribution

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

1. In the first rectangle put your contribution amount and check ASHRAE Research circle.
2. Check the box for endowed support
3. In existing fund name copy : S California Chapter
4. If you want to support scholarship please fill the scholarship amount and pick general
5. Click on personal contribution
6. Under contribution information field in red are required, fill out your information
7. SUBMIT and wait for your name to pop up a san honor roll investor !

**Invest in ASHRAE and Help Shape our Future**

I would like to financially support ASHRAE's mission, programs, and member services indicated below. (Indicate the amount you wish to contribute in U.S. dollars to any or all resources below.)

U.S.\$  ☒ ASHRAE Research ☐ ASHRAE Research Canada  
U.S.\$  ASHRAE Learning Institute and educational programs  
U.S.\$  Endowed Research via ASHRAE Foundation.

☒ By checking the box, I indicate that I understand that these are endowed funds and permanently restricted for the support of ASHRAE Research.

Existing Fund Name (if known):   
[Click here to see existing endowments](#)

U.S.\$  ASHRAE Scholarships (endowed scholarship support)  
(Select One)  
If "Other" is selected, please enter the name of the Scholarship

U.S.\$  ASHRAE General Fund  
U.S.\$  Young Engineers in ASHRAE (YEA) Support  
U.S.\$  Total contribution to be charged to credit card

**Please check one:**  
☒ Personal Contribution ☐ Company Contribution ☐ Chapter Contribution  
(Honor Roll level contributions listed in ASHRAE's October Journal Issue start at \$100.00 for individuals and \$250.00 for companies.)

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## REMEMBER: All donations to ASHRAE are tax-deductable!

# Membership Corner



## Membership Promotion

To become a member of the Southern California Chapter you must first be a member of Society (for more info, please visit [www.ashrae.org/membership/join](http://www.ashrae.org/membership/join)). If you are currently a member of Society and wish to join the Chapter, you can synchronize your renewal dates by paying pro-rated Chapter dues. Society membership is \$205 for Associates and Members, \$21/\$79/\$105 (Fee per year at a 3 year introduction) for Affiliates, and \$21 for students; Chapter membership is \$60 for Affiliates, Associates and Members and \$10 for students. Student Transfer membership allows you to maintain a reduced membership for the two years following graduation.

\*Rate changes every year for the first 3 years.

If you have any questions about your membership, please don't hesitate to contact **Laura Jelin** by phone at [949-354-1626](tel:949-354-1626) or by email at [Laura.Jelin@yahoo.com](mailto:Laura.Jelin@yahoo.com)

### ***HAVE YOU PAID YOUR MEMBERSHIP DUES?***

Even though you have paid your Society membership dues, don't forget to pay your Chapter dues. Chapter dues go directly to the SoCal Chapter and are greatly appreciated. If you haven't paid your Chapter dues yet, please be sure to stop by reception at the next chapter meeting and we can accept your dues directly. Thank You!

## SmartStart

Are you a Student Member that recently graduated? Do you know someone that is? First off, welcome to the real world! Secondly, you should all take advantage of the SmartStart Program! SmartStart is a 3-year program that allows Student Members to transfer to Associate grade membership at a fraction of the cost:

First Year: \$21

Second Year: \$79

Third Year: \$105

Join within 6 months of your graduation date to take advantage of the SmartStart program now!

([https://fs12.formsite.com/ashrae/form581146616/secure\\_index.html](https://fs12.formsite.com/ashrae/form581146616/secure_index.html))

# Member Badges

Did you know that every chapter member is entitled to a member badge? Well, now you do!

Member badges are kept in a badge tray and are available for each in-person program meeting. Make sure to get one and wear it to show support of the chapter. It will also help to make introductions much easier!



If you are a member lacking a badge, be sure to contact **Jim Toda** <[todayam@yahoo.com](mailto:todayam@yahoo.com)> and request one for yourself!





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Please contact Aaron Deutsch ([aaron@drymaxxair.com](mailto:aaron@drymaxxair.com)) to apply

# Advertisements

## Controls Design Engineer

Western Allied designs commercial building control systems in the best possible design environment. Our controls design engineers work with everyone from mechanical system design engineers to field foremen to long term service personnel. We design, install & maintain systems for building owners, maintaining contact with them for decades, so direct support and feedback on our designs and installation are integral to what we offer.



We seek an experienced HVAC Controls Design Engineer to work in our Controls Division.

Specific duties will depend upon level of training. The ability to effectively communicate (verbally and in writing) in a dynamic, fast-paced environment is fundamental. We seek an energetic, detailed oriented individual who enjoys a challenge, wants to learn (we do a lot of training), and takes pride in their work. We provide significant training and mentorship and want someone who will take that opportunity to grow & learn seriously. This position is in a designer role, expected to work in the office. Many of the duties will revolve around development of Building Automation System drawings, wiring schematics, P&IDs, and control panel layout drawings for distributed building controls/DDC systems, as well as development of distributed control network architectures. We frequently perform systems integration with a variety of self-contained HVAC, lighting, metering and tenant HVAC billing systems. Because this work involves building real buildings that we typically support for decades thereafter, a sense of pride and accomplishment in seeing your work turn into a real, tangible building is both helpful and desirable. You will have an opportunity to interface with both office and field professionals, and understand both how your work relates to the rest of the design & installation process, and how to improve the next design. We never stop learning.

Total compensation range depends upon knowledge; anticipated range \$90K – 130K.

For more information, visit the job's webpage: <https://www.wasocal.com/controls-career/>

# Sol\*Air Supporters

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