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Sol*Air



Newsletter for the Southern California Chapter of ASHRAE

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JANUARY MEETING

Tuesday, January 9, 2024 5:30 PM - 8:00 PM

Revolutionizing Cooling Tower Water Management: Sustainability Through Innovation

Brie Braach - Solutions Engineer, Clear Comfort Water

Chapter Members: \$65
Non-Members: \$75
Students are free!

SAVE \$5 with Early Bird sales!

REGISTER

LOCATION:

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

UPCOMING EVENTS

A friendly reminder that ASHRAE SoCal is going to be recognizing the companies with the most members. Please be sure to update your ASHRAE profile with your current place of work and remind your coworkers the benefits of being an ASHRAE member!

-Membership and Research Promotion

Visit us: ashrae-social.org

For ASHRAE news and society headlines, please check:
ashrae.org/about/news



About the Meeting

SoCal ASHRAE Presents:

REVOLUTIONIZING COOLING TOWER WATER MANAGEMENT: SUSTAINABILITY THROUGH INNOVATION



Cooling towers play a pivotal role in various industrial processes by dissipating excess heat generated during the operation of systems like power plants and HVAC units. This abstract delves into the fundamentals of cooling tower water consumption, shedding light on the considerable volumes of water these structures utilize. The presentation emphasizes the critical need for understanding and addressing this aspect, drawing attention to the environmental implications and the imperative for sustainable water management. By elucidating the magnitude of water consumption, the abstract explores the nexus between cooling tower operation and water conservation, underscoring the significance of responsible water usage in the broader context of resource stewardship.

Furthermore, the abstract explores innovative approaches to mitigate the environmental impact associated with cooling tower water consumption. Leveraging insights from a seminar presented at the ASHRAE Kansas City conference in 2019, the discussion introduces alternative water treatment methods aimed at reducing water consumption while maintaining the efficiency of cooling towers. One notable approach highlighted in the presentation is the GSA/NREL study employing Advanced Oxidation Process (AOP) technology. This cutting-edge study demonstrates the potential to minimize water consumption and environmental impact, offering a promising avenue for sustainable cooling tower operation. The abstract underscores the importance of adopting such innovative technologies to foster a more ecologically responsible approach to cooling tower water management.

Speaker Biography



Brie Braach

Solutions Engineer
Clear Comfort Water

Brie Braach is a Solutions Engineer for horticulture at Clear Comfort Water, and she is responsible for providing water treatment solutions for CEA and cooling tower clients. Prior to joining CCW, Brie worked in commercial HVAC water treatment and groundwater remediation. Having dealt with water treatment technology across from multiple industries, Brie has a clear understanding of today's water challenges and opportunities within the sector. She is also a member of AWT.

Brie has a Bachelor of Science (BS) in Chemical Engineering with a minor in Biochemistry from the University of Colorado. She also holds an MBA from the University of Northern Colorado.

President's Message

Dear SoCal ASHRAE members,

Hello and welcome to 2024! I hope you had a restful break with your family and friends.

Tis the season to make new year's resolutions, so why not make one of them to attend more ASHRAE meetings? They're informative, good for your career, and include some fun networking time to help you connect with your industry peers. In my experience, nothing quite invigorates my excitement for my job quite like attending an ASHRAE meeting (and I felt that way even before becoming president, I promise!). Our first meeting of the 2024 year will be with Brie Braach, who is drawing on her wealth of knowledge of the water industry to give us ideas on how to reduce water consumption while maintaining cooling tower efficiency. Next month, we will have Kent Peterson fresh from the ASHRAE Winter conference presenting on the latest developments from the ASHRAE decarbonization taskforce.

On a personal note, I will be going on maternity leave starting in February. I will be supporting the chapter from afar while our President-Elect, Rafi Karim, fills in as chapter president. I am so appreciative of Rafi for stepping up, and I know the chapter will be in good hands while I am gone!



Elyse Johnson McBride

ASHRAE SoCal President, 2023-2024

Obituary for Dale Au

Long time So Cal ASHRAE member, Dale Au, passed away on November 5, 2023.

Dale attended Occidental College in Los Angeles, majoring in Geology. After graduating he worked at Shell Oil, then was in the military. After his military service was completed, he joined the HVAC industry working at d'Autremont-Helms & Associates for 22 years. He also worked for Graycon Inc. for six years, Ice Energy, KSR Associates for five years, and the last six years at Turpin & Rattan Engineering. He was always proud that his HVAC career went full circle. He started in Engineering, then went to contracting, then sales, then back to Engineering.

Dale loved the outdoors and was a competitive skier. He was also an Eagle Scout. He is survived by his daughters Kira Grund and Natalie, and his son Kyle.



Mike's Monthly Maintenance

by Mike Gallagher, MGallagher@wasocal.com

Some little, everyday things...for everyday specifications

Last column written in 2023. Time to clean out the junk drawer to cover various small things about which I've made notes over the past year or two.

First, a question: What do instantaneous water heaters and water source heat pumps have in common? And how does that relate to your piping detail for each?

Think, "cleaning". Remember that instantaneous water heaters can be used for both domestic water heating and comfort conditioning water loop heating. Particularly for domestic water heating, most O & M manuals recommend an annual removal of the scale that builds up in the heat exchanger from the heating of the city water that runs through the heater. I've learned that even in building heating applications it is needed every 3 years or so. I'll bet a lot of plumbing designers don't think about that. The manuals go on to note that if domestic water is being heated, it is necessary to use a descaling compound that is safe for use in a drinking water system. Vinegar is one of the recommended descaling solutions, although there are others. But that begs the question, how is a service tech supposed to circulate the descaling solution? For both water source heat pumps and instantaneous water heaters, the answer relates to the connecting piping. A ball valve with a hose connection is recommended to be installed on both the inlet and outlet piping, between the isolation valves and the heat exchanger. If there are hose connections on both lines, a technician can do two things. He can cross-connect supply water to the return side of the heat exchanger, then reverse flush the heat exchanger into a bucket, thereby physically back-flushing crud out of the heat exchanger and leaving it visible in the bucket. He can also use a similar procedure with a pump and bucket to circulate the descaling solution of his choice. Many water heater manufacturers have single piece valves available specifically for this purpose and recommend

their installation with the heater. I'll note again that even in a closed loop heating system application, the descaling process will be necessary every few years, and the valves with hose connection should be installed.

I hope you have leaped ahead of me to see how water source heat pumps are similar. The coaxial heat exchangers used in the heat pumps pass the water through tiny orifices. These can get plugged with very little cause. I've found that if little or no minerals are involved (rust flakes, dirt or piping debris), a simple reverse flush with enough flow and pressure will usually clean them out. But if mineral deposits are part of the obstruction (typical in an open tower application), a descaling solution is needed. Unfortunately, we seldom have these valves and generally have to add them after the fact...at a much higher cost than if they had been installed with the unit. I would consider this to be essential when a heat pump is used on an open condenser water loop, regardless of the level of strainer used. For closed loops with only copper piping you might justify not using them, but if you have a significant amount of steel piping present (risers are typically steel), the valves are likely to eventually be needed due to rust particles.

The next subject concerns a frequent cause of service calls. Whenever equipment needing a condensate drain system serves multiple units (in a ceiling; on a roof; or anywhere), problems can occur for many reasons. As time passes and units get added or other work is done surrounding the units, a drain system that might originally have been OK moves further away from being OK. Eventually, problems happen. I've noticed that when TI revisions are performed, something that is almost never examined by the consultant is the existing drain system. In many cases it would be better to simply scrap the old system and run new lines...properly supported... with a union at each p-trap. And when laying out any

Mike's Monthly Maintenance

multi-unit drain system, reflect on how such a system is to be cleaned when it gets plugged. Remember that if a central line is used with multiple branches to individual units, you can't use compressed air to blow out an individual line...the air will simply find an alternate path to escape. Since isolation valves are a dicey proposition for permitting individual line pressurization (too easy for a nitwit to inadvertently close it), what I've found to be most effective is unions at the major pipe branches. This approach means two (2) unions for every piece of equipment that is sharing a common condensate drain main line; one where the branch line connects to the main line, and one where the AC unit is located. Do not let the bonehead contractor miss this; it needs to be on your detail! Two unions lets a service tech disconnect the run that is blocked and blow backwards. Another thing to check is condensate line size when units are being replaced. For example, when replacing a 40 ton packaged unit with a 50 ton (easy to do; if the units are more than 25 years old, the efficiency improvement probably lets you use the same electrical service) make sure you upsize the condensate drain all the way to the main sewer point of connection, or you risk overflows. This is the sort of code requirement that is easy to miss.

When installing rooftop units, remember that you have two choices: downshot through a curb or side discharge with roof duct penetrations. The cheaper, noisier way is downshot on a roof curb, which also exposes the area beneath the unit to water if the unit leaks rain water or the condensate drain plugs. The slightly more expensive way is to utilize side discharge duct connections, supporting the unit on a roof platform and providing a separate roof penetration for the supply and return ducts adjacent to the unit. The result will be quieter and less of a water risk.

Remember that the newer replacement units are usually more efficient...and usually physically larger, though they are often lighter. If space is tight, be sure to check size, configuration and clearance. Remember, you probably have a high voltage electrical panel on the AC unit that will require a minimum amount of clearance. If you are working in a ceiling, joists will often limit that electrical panel clearance. On a roof, the parapet wall, skylights or other AC units are common causes of inadequate clearance. Unit replacements on a crowded roof or in a crowded ceiling often require some unit relocation.

Skylights and tight clearances to the edge of the roof also bring up a safety issue. There needs to be something to which a service person can connect a safety harness tether in order to work safely. Sure, skylights are weight rated, and a new one is probably going to prevent someone from falling through. But we've learned the hard way in our industry that enough UV exposure will eliminate that strength and create a safety hazard. Iron bars below the skylight are good, but not always installed. The real answer is a rail or anchor point. Our techs end up using electrical disconnects for this purpose, and while that can work, it creates its own set of potential hazards if the disconnect is mounted directly to the unit. Specify that the disconnect will be separately mounted on the roof or a wall, rather than on the unit itself. Our industry has become more safety conscious, due to a combination of severe accidents and resulting insurance company pressure. Do your part.

Finally, here is a subject that gets no attention: exhaust fan selection. The next time you select a belt drive or ECM motor centrifugal exhaust fan of any type (in-line, dome exhaust, up blast, what ever), think about your standard selection method. Pick the fan. Then compare that selection to the next larger size at the same conditions. Look at the reduced brake horsepower. Then think about how many hours the fan will operate. *The standard selection of yesteryear is usually not the best selection today.* Sometimes it is worth considering going up two sizes from the minimum. The added benefit is sound. Larger fans mean lower RPM and less noise.

The happiest of holidays to you! Remember, there is no such thing as a sustainable design if the design ignores maintenance sustainability. And as always, let me know if any questions or comments. MGallagher@wasocal.com

Research Promotion

Corporation and Individual tax deductible **contributions** helped ASHRAE fund the following **Research**

IDENTIFIER	TC/TG	COST	RESEARCH TITLE OR SUBJECT	CONTRACTOR
1408-RP	2.06	\$149,839	The Effect of Lining Length on the Insertion Loss of Acoustical Duct Liner in Sheet Metal Ductwork	U. NEVADA- Las Vegas, NV
1455-RP	1.04	\$160,000	Advanced Control Sequences for HVAC Systems - Phase I Air Distribution and Terminal Systems	TAYLOR ENGINEERING - Alameda, CA
1469-RP	5.10	\$350,000	Thermal Comfort in Commercial Kitchens	KEMA, INC. - Oakland, CA
1515-RP	2.01	\$174,714	Thermal and Air Quality Acceptability in Buildings that Reduce Energy by reducing Minimum airflow from Overhead Diffusers	UC-BERKELEY - Berkeley, CA
1544-RP	6.06	\$194,850	Establishing Benchmark Levels and Patterns of Commercial Building Hot Water Use	APPLIED ENERGY TECHNOLOGY - Davis, CA
1588-RP	4.07	\$75,000	Representative Layer-by-Layer Descriptions for Fenestration Systems with Specified Bulk Properties such as U-factor and SHGC	WHITE BOX TECHNOLOGIES, INC. - Moraga, CA
1609-RP	7.03	\$110,000	Defining the Capabilities, Needs and Current Limitations of Building Information Modeling (BIM) in Operations and Maintenance for HVAC&R	HITCHCOCK CONSULTING - Kelsey, CA
1665-RP	3.02	\$103,685	R-40 Stability with HVAC&R System Materials	McCAMPBELL ANALYTICAL, INC. - Pittsburgh, CA
1673-RP	9.12	\$90,000	Revision of the ASHRAE HVAC Design Guide for Tall Commercial Buildings	B&S Analytics - Marina Del Ray, CA
1682-RP	5.02	\$117,719	Study to Identify CFD Models for Use in Determining HVAC Duct Fitting Loss Coefficients	Embry-Riddle University - Prescott, Arizona
Grant 14-15	2.01	\$20,000	Support for the Development of ASHRAE Thermal Comfort Database Mark II	UC-BERKELEY - Berkeley, CA & U. SYDNEY, Australia

Support Future Research in
Building Science & Air Conditioning !

For online contributions go to www.ashrae.org/contribute



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 !

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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
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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):
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U.S.\$ ASHRAE General Fund
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Rey Ong
rong@siglers.com

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). 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 **Shahpoor Khosravi** by email at Shahpoor.Khosravi@p2sinc.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)

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