October 09, 2019 - ASHRAE CNY Chapter Monthly Meeting:

Program: Domestic Water Temperature Control

Presenter: Mr. Rob Lax, FW Webb/Process Controls Division

Time: 5:30pm - 8:00pm

PDH: 1

Location: Dinosaur BBQ—246 W Willow St, Syracuse, NY 13202

Description: Domestic water temperature control design consideration to achieve over all energy savings through consistent & accurate management of temperatures. Applicable to both comfort & process applications with discussion points to include capacity vs. space, system stall, pitfalls of storage tanks, etc.

Chris Devine
-Vice President & Program Chair
I'd like to welcome back our current members as well as welcome any new members as we kickoff the 2019-2020 year with the CNY ASHRAE Chapter. In August we held our first meeting at the Dinosaur BBQ where instead of a typical presentation and dinner we held an informal happy hour with a joined network event. We had a great turnout and had some new faces show up as well. In mid-September we held our first formal meeting with a presentation topic of “Energy Storage in NYS – Lowering Peaks to Reduce Utility Bills” presented by Evan Berger, the Director of Energy Storage at Calmac-Trane.

In other news we will be starting up the Syracuse University Senior Design project. Last year we partnered with a group of senior Mechanical Engineering students at SU as representatives for their senior design. The design was a full HVAC design of an office building which included codes and standards, load calculations, system selections, and energy payback. The project was met with great success and the university invited us back for another year. As the project continues we will be bringing the students to our meetings for further updates. Moving towards our third meeting of the year I am very excited for the events and programs that we have lined up and I hope that you all continue to volunteer your time to further your involvement with the local chapter. I hope to see you all next month and hopefully some more new faces!

Geoff Sincavage

-CNY Chapter President 2019-2020
I want to thank all CNY Chapter members again for having me serve as Chapter President in 2018-2019 year. As the new ASHRAE 2019-2020 starts, here is a summary of what happened in our Chapter during the summer.

We had our last Chapter meeting on May 8th at Dinosaur BBQ, where our new Board of Governors installed for ASHRAE 2019-2020 year. Please refer to our Chapter website and 2019-2020 BoG roster in April Newsletter for details. As always, we had the pleasure of having society past president Don Rich and past Region I DRC/current Chapter Historian Bill Walter joining us in the new BoG installation.

Additionally, we also had society current President Elect Chuck Gulledge and Region I DRC Chris Phelan visiting us. Chuck delivered a distinguished lecture on Design-Build-Operate-Maintain: What Could Possibly Go Wrong, which was very well received. Chris brought several messages from the society and the region, which shed light on our Chapter operations, especially for the upcoming year.

Last but not least for the May meeting, we also rolled out our Chapter first “CNY ASHRAE Hall of Fame – contributions to CNY ASHRAE and the HVAC industry”. Bill Walter was inducted to the Hall of Fame this year, along with others as follows:

- 2013 Paul Briton
- 2014 Don Rich
- 2015 Edgar Galson
- 2016 Jack Koening
- 2017 Chris Martin
- 2018 Jensen Zhang
- 2019 Bill Walter

Figure 1. CNY Chapter May Meeting: new Chapter BoG installation, society current President Elect Chuck and Region I DRC Chris visiting, CNY ASHRAE Hall of Fame awarded to Chapter Historian Bill this year.

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Our Chapter also had our annual Golf Tournament and 78th Annual CNY Clambake in Spinning Wheel. Despite the drizzle and the first year we have in Spinning Wheel, we still had about 1,000 people came. I want to thank these volunteers who has been working hard behind the screen to bring many of us in the industry once a year in the clambake together!

Figure 2. The 78th Annual CNY Clambake in Spinning Wheel.

This year’s summer conference was held in Kansas City, MO, June 22-26. A couple of things relevant to our Chapter and Region. First, Bill Walter, Chapter Historian retired from Carrier, was honored the ASHRAE Exceptional Service Award at the Society’s Annual Conference. And the Region I dinner was held at Jack Stack BBQ Freight House place in Kansas City. Many of us came during the busy annual conference, the DRC Chris thanked all for their support of the regional dinner.

Figure 3. Region I dinner during society’s annual conference in Kansas City.

The 2019 Region I CRC was hosted by Niagara Frontier Chapter during their 100 year celebration. The hosting hotel and the presidential dinner venue were very unique, but most importantly we have received many recognitions and awards during the CRC. In addition to several Chapter members serving as Region Vice Chairs, some of our Chapter awards are listed as follows – it’s been a great ASHRAE year thanks to the contributions from all Chapter board of governors!

- CNY Chapter, ASHRAE Community Sustainability Project
- Chonghui Liu, Presidential Award of Excellence and
- Chonghui Liu, Presidential Award of Excellence - Star Award Special Citation
- Chonghui Liu / CNY Chapter, Black Ink Award
- Tim Anderson, RP Certificate of Achievement, Full Circle Chevron, Endowment Chevron
- Andrew Brownell, Student Activities RVC “Top Dog” Award
- Brendan Hall, Outstanding Chapter Performance Award
- Steve Sill, CNY Chapter Service Award
- Charlie Bertuch, CNY Chapter Service Award

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New York Department of State proposes adoption of ASHRAE 90.1-2016.

The proposed rule would repeal the current version of the Energy Code and adopt an amended and updated version of the Energy Code. The amended and updated version of the Energy Code would incorporate by reference the following publications:

- 2020 Energy Conservation Construction Code of New York State (the "2020 ECCCNYS")

A copy of the 2020 ECCCNYS is available at https://www.dos.ny.gov/dcea/pdf/2020%20ECCCNYS%20June%202019.pdf

Certain provisions of ASHRAE 90.1-2016 would be amended as set forth in the proposed rule amending 19 NYCRR Part 1240. Public comment ended September 10th.

New York to Approve One of the World’s Most Ambitious Climate Plans

June 18 - The state would pledge to eliminate net greenhouse gas emissions by 2050, with all its electricity coming from carbon-free sources. New York lawmakers have agreed to pass a sweeping climate plan that calls for the state to all but eliminate its greenhouse gas emissions by 2050, envisioning an era when gas-guzzling cars, oil-burning heaters and furnaces would be phased out, and all of the state’s electricity would come from carbon-free sources.

Under an agreement reached this week between legislative leaders and Gov. Andrew M. Cuomo, the Climate Leadership and Community Protection Act would require the state to slash its planet-warming pollution 85 percent below 1990 levels by 2050, and offset the remaining 15 percent, possibly through measures to remove carbon dioxide from the atmosphere.

Operational conditions in restaurants and convenience stores (c-stores) are notoriously hard on refrigeration equipment. High temperature fluctuations, foot traffic, dirt and debris, grease, and general abuse from employees and/or customers can wreak havoc on units, particularly if they are not well maintained. Scheduling maintenance in these facilities can be difficult because they are usually open many hours of the day — if not all day — and there is never a convenient time to interrupt operations. However, if units are not regularly serviced and maintained, they may break down more frequently, which is usually even more inconvenient — and expensive — for the end user.

RESTAURANTS

Restaurants often contain a variety of refrigeration equipment: everything from reach-in refrigerators and freezers to ice machines, salad and sandwich prep stations, beverage dispensers, walk-in coolers, and freezers. The restaurant environment is very hard on refrigeration equipment, and regular maintenance is often overlooked, said Adam Armistead, field service supervisor for Electric Motor Repair in Rosedale, Maryland.

“Problems for poorly maintained equipment are vast,” he said. “They can be something as small as a few degrees off temperature to as large as a total equipment replacement. Failed compressors and fan motors, leaking or restricted refrigerant systems, and damaged evaporator plates in ice machines are some of the more common problems in equipment that has not been maintained.”

Justin Cockle, director of service operations at The Arcticom Group in Murrieta, California, notes that many restaurant customers struggle with maintenance because there is often no good time to interrupt their operation for equipment work.

“The lack of upkeep causes the equipment to fail at a higher rate, consume more energy, and shorten the life of the equipment, all of which affects the facility’s bottom line,” he said. “Spending money upfront reduces overall costs and downtime of equipment.”

To that end, one of the most important aspects of regular maintenance is making sure the condensers are consistently cleaned — monthly, quarterly, or yearly, depending on the type of condenser and environment in which the refrigeration unit is operating, said Travis Scola, innovation manager at Minus Forty Technologies, Georgetown, Ontario. Failure to perform regular cleaning of the condenser can result in overheating of the compressor, leading to its failure.

“Most units sold today are self-defrosting, but if the restaurant has manual defrost units, defrosts should be scheduled regularly to prevent serious damage to compressors,” he said. “Fin-style condensers will require more frequent cleaning. Make sure to use separate cleaning materials for the outside and inside of units, to prevent any transfer of bacteria that could contaminate the food. And keep cleaning equipment for refrigeration units separate from those used for floors or other equipment in the restaurant. In all matters, be sure to follow the manufacturer’s cleaning instructions.”

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The cleaner used on the condensers of air-cooled equipment will vary depending on the type of contaminants in the coil, whether it’s grease or just dirt and debris, said Denny Martin, technical support engineer at Embraco, Duluth, Georgia. Some cleaners come in aerosol cans and are rinse free, while more aggressive chemicals may be needed to dissolve grease on coils, and these usually require a water rinse.

“Performance checks with temperature drops, amp draws, and general cleaning should be performed as part of a regular maintenance routine as well,” he said. “Larger walk-ins with additional controls may require more maintenance checks, and superheat or subcooling calculations may be needed to verify correct refrigerant charge. Compressor and condenser motors should be checked with a megohmmeter as well.”

Evaporator fans should also be checked, said Scola, as these require proper air circulation in order to operate correctly. Employees and suppliers should know how to pack the units so that airflow is not impeded.

“When cleaning the glass and the doors, conduct a visual inspection of the gaskets all the way around the seal to make sure there are no gaps or tears,” he added. “Changing a gasket is relatively easy and costs very little when compared to the energy costs that are incurred if the unit must work overtime.”

Regular maintenance should also include cleaning out the drain lines, checking thermostat differentials on all equipment, and ensuring the defrost circuits on freezers are functioning properly, said Armistead. In addition, the door frame heat of walk-in coolers and freezers should be checked to ensure that it is operating, and door closers should be checked for proper function.

“Ice machines and bins also need to be cleaned, sanitized, and water filters changed, and glycol chillers should be checked for proper mix and for algae buildup in the reservoir,” he said. “I suggest this maintenance be performed every six months, but after the first good cleaning, we will look at how dirty the equipment gets and then make a determination with the owners about whether the frequency needs to be increased or decreased.”

C-STORES

C-stores often have the same types of refrigeration equipment as restaurants, so maintenance procedures are usually the same as those described for restaurants. The difference is that c-stores typically have more self-contained cases, frozen beverage machines, and ice machines, as well as walls of built-in coolers and freezers. In addition, grease is less of an issue in c-stores, but they often have more dirt, dust, and debris due to large amounts of foot traffic.

“Independent c-store customers can be hard on their equipment in ways they may not understand,” said Cockle. “It’s not necessarily related to abuse, but to the overall conditions of their locations. Most struggle with the needed electrical requirements for plugging in multiple cases, which puts an electrical strain on their panel, causing refrigerated cases to fail along with other equipment.”

The other factor that often affects self-contained refrigerated cases is the location’s space temperature, he said. That’s because most cases are designed to operate within a certain ambient temperature, but in many c-stores, the air conditioning system was not designed for the added heat load, and it may be in poor shape. These conditions can result in case failures, as well as causing air conditioning units to work harder, which costs more money for the store owner.

In addition, c-store owners often try to cut costs by not running their air conditioning systems on hot days, which is tremendously hard on compressors and fan motors, said Armistead.
Another problem with c-stores is that the equipment may not have been installed correctly in the first place. As Sco-la noted, the key to installing any stand-alone refrigeration unit is to ensure that the unit has a dedicated power line and space around the cabinet for proper ventilation. Due to space limitations, owners will often try to squeeze equipment into confined spaces, and this can result in the breakdown of equipment due to poor ventilation.

As far as maintenance is concerned, Armistead has found that once equipment is installed in a c-store, it is usually never touched again until there is a problem.

“Equipment is usually installed and then forgotten about — left to live out its service life with little to no preventive care,” he said. “This translates into big trouble for the owners in the form of costly parts failing and loss of revenue, because let’s face it, nobody wants to drink a hot beer at the end of a long work day.”

Lack of maintenance can also lead to larger energy bills for owners, said Martin. That’s because c-stores usually have more commercial refrigeration equipment than restaurants, and poorly maintained machines have the potential to use excessive amounts of electricity.

“With restaurants, sometimes a piece of equipment that is down can be worked around, but with convenience stores, every refrigerated unit is part of their merchandising space and has significant impact on the store’s sales and, consequently, their potential to make money,” he said. “It is easy to see how poorly maintained refrigeration equipment can affect a convenience store’s bottom line.”

**MONEY-SAVING UPGRADES**

C-store and restaurant owners who invest in regular maintenance may also be interested in retrofits that can improve system performance while saving energy. These can include variable-speed technologies, electronically commutated motors (ECMs), and new controls.

“Reach-ins and other unitary equipment with variable-capacity compressors can adjust to heat loads very precisely to consume less energy,” said Martin. “Equipment that uses natural refrigerants like R-290 (propane) can also have a huge effect on energy usage. Embraco has supported the switch to hydrocarbon refrigerants in the U.S., and it’s been exciting to see the efficiency improvements with this technology.”

Energy management systems (EMS) can also be retrofitted into virtually any application, noted Cockle, and there are a host of new technologies, including standalone controls and WiFi-compatible controls, that can be managed through smartphones.

Charles Bertuch
- Chapter Refrigeration Chair