



# CHIEF ENGINEER™

AUGUST 2023

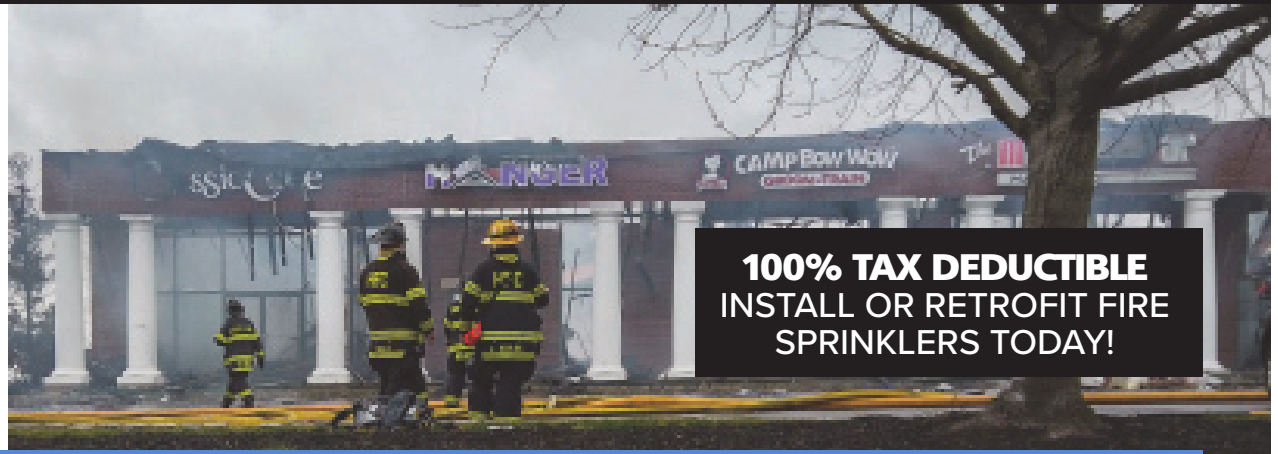
## THIS MONTH'S ISSUE

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History and Hot Water Systems at the Palmer House Hilton • Pg 20

# DON'T LET YOUR BUSINESS GO UP IN FLAMES!



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## DEDUCT THE FULL COST OF QUALIFIED PROPERTY IMPROVEMENT!

### CARES ACT

The Coronavirus Aid, Relief, and Economic Security (CARES) Act closed a loophole that was included in the TCJA by making QIP 15-year property. This change made businesses of all sizes, regardless of the amounts spent on equipment, eligible to deduct the full cost of commercial fire sprinkler systems using bonus depreciation.

The time is now to upgrade your building's fire safety with a fire sprinkler system or a sprinkler retrofit. Under the new Section 179 guidelines, the one year deduction period phases out after 2022. Any new sprinkler system or retrofit completed between September 27, 2017 and December 31, 2022 will be able to be fully expensed in one year. After 2022, the allowed deduction percentage is as follows:

2021: 100%	2023: 80%	2025: 40%
2022: 100%	2024: 60%	2026: 20%

2027 and after: The depreciation schedule becomes permanently set at 15 years.

### WHAT IS QIP?

The Tax Cuts and Jobs Act (TCJA), passed in December, 2017, gave small businesses the ability to deduct the full cost of Qualified Improvement Property (QIP) up to \$1.04 million in the year of installation using Section 179.

QIP is defined as improvements to the interior of an existing building that is not residential property. Commercial fire sprinkler systems, including upgrades of existing systems or retrofitting in existing structures, are considered QIP.

The Section 179 deduction is not phased out over time. However, there is a phase out of the amount allowed as a deduction based on a maximum spending amount of \$2.59 million on equipment in a year. Businesses that spend over that amount will see a dollar for dollar reduction of their eligible deduction. So a business that spends \$3.63 million or more on equipment in a given year would not be allowed any Section 179 Deduction.

### WHAT HAS CHANGED?

Prior to the TCJA allowing Section 179 on qualified improvement property, including sprinkler systems, property of this type was only allowed a deduction on a straight line basis over a period of 39 years. In other words, a company spending \$390,000 on a commercial sprinkler system prior to the TCJA would only deduct \$10,000 per year for 39 years.

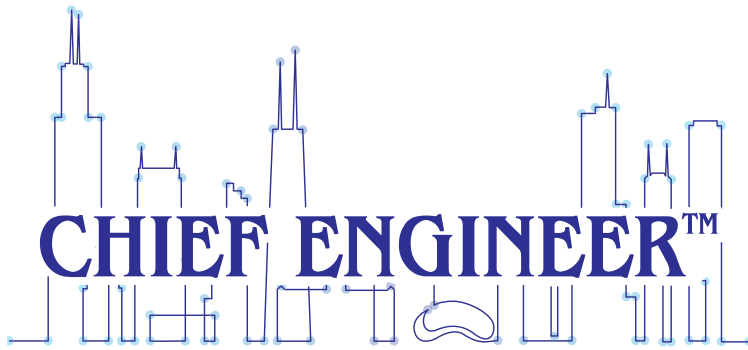
While many believe that the intention of Congress was to make Qualified Improvement Property 15-year property, which would have made this property eligible for bonus depreciation, the TCJA left the life of this property at 39 years. So, a taxpayer who did not elect to use the Section 179 Deduction or who has that deduction phased out would have been left to depreciate the remaining balance of the assets over a 39-year period.

Neither of these deductions is currently available for fire sprinkler systems installed in residential high rises. The National Fire Sprinkler Association (NFSA) continues to fight to obtain incentives for residential structures.

For more information on how these tax incentives might impact the business of your contractors, we would recommend that they contact their tax professionals, as situations differ based on the facts and circumstances for each business. As a general rule, we would not recommend that the Local provide tax advice to the contractors.

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VOLUME 88 • Number 8

Official Magazine of the

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The Chief Engineers Association of Chicagoland magazine is published 12 times per year by the Chief Engineers Association of Chicagoland.

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Subscription rate is \$36.00 per year in the United States and Canada; \$110.00 per year in all other foreign countries. POSTMASTER: Send address changes to 22 W. Washington St., Suite 15112, Chicago, IL 60602

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## 20 History and Hot Water Systems at the Palmer House Hilton

We take a look at the original hot water system and the current retrofit at the nation's oldest continuously serving hotel, the Palmer House Hilton.

## 14 Rise to a Higher Level of Training

AETOS OPERATE offers a handy digital complement to augment the learning experiences available at the IUOE Local 399 Operating Engineers Technology Center.

## 16 Growth and Gratitude – the Door Service, Inc., Story

Rod Dunlap discusses the origins of Door Services, Inc., and how the company differentiates itself in the industry.

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Dear Members,

As we begin a new routine with our newly redesigned Chief Engineer magazine, we beg your pardon for the delays, and assure you that we are working to get things back to normal as soon as possible. To that end, I would like to appeal to everyone out there who might be doing some interesting work, be it a challenging retrofit, work in a landmark Chicago-area facility or other structure, or, for you Associate Members, a job that showcases you doing what you do best. If you're doing work that you think might be of interest to the Chief Engineers, please let us know by emailing Tom Phillips at [tphillips@chiefengineer.org](mailto:tphillips@chiefengineer.org) and editor Karl J. Paloucek at [kjpaloucek@gmail.com](mailto:kjpaloucek@gmail.com). This can be a great opportunity to spread the word about the work you do, particularly for our Associate Member organizations. The time commitment is minimal, and the rewards can be great. We look forward to hearing from you soon.



As summer progresses toward its end, we're looking forward to our 83rd Annual Chief Engineers Association of Chicagoland Golf Outing. On Friday, Sept. 8, at Cog Hill, things will commence with a shotgun start at 9:00am. Registration is now open, and sponsorship opportunities are available, as well. If you have any questions about the Golf Outing or your participation in it, please reach out to Kevin Kenzinger at [kevin@thestone.group](mailto:kevin@thestone.group) or (773) 350-9673, or Brendan Winters at [brendan@thestone.group](mailto:brendan@thestone.group) or (708) 535-7003. Remember that this is the most popular CEAC event of the year, and that available slots fill up fast, so don't wait — register your foursome soon at [tinyurl.com/CEACgolfouting](http://tinyurl.com/CEACgolfouting).

And of course, when the Golf Outing is approaching, we should be thinking about the upcoming heating season, and starting on the required maintenance of our boilers and heating systems for the cold weather that we may not like, but isn't all that far off. Now is the time to schedule any outside maintenance that might be required, so remember to reach out to our Associate Members for that outside assistance.

With the new magazine and the Golf Outing coming up, we're off to a strong start for a new and rejuvenated CEAC for 2023-2024, and I look forward to seeing you at Cog Hill, as well as at our upcoming Oktoberfest event (info TBA) and our November meeting at Sox park Nov. 15. It's looking like a great year ahead, so let's all be part of it, and help to bring in new members!

Lastly, as always, let's keep in mind our first responders and our men and women in the military whose sacrifice helps to preserve our way of life in our nation and in our communities.

We'll see you out on the links!

Sincerely,

Ken Botta



# ASHRAE Publishes Standard 241, Control of Infectious Aerosols

ASHRAE has published its pioneering consensus-based, code enforceable standard, developed to reduce the risk of infectious aerosol transmission in buildings.

ASHRAE Standard 241, Control of Infectious Aerosols can be purchased at [ashrae.org/241](http://ashrae.org/241).


Standard 241 establishes minimum requirements to reduce the risk of airborne disease transmission, such as SARS-COV-2 virus, which causes COVID-19, the flu virus and other pathogens in buildings like single and multi-family homes, offices, schools and healthcare facilities. The standard applies to new and existing buildings and major renovations and provides requirements for many aspects of air system design, installation, operation and maintenance.

Important topics addressed in the standard:

**Infection Risk Management Mode (IRMM)** – Establishes requirements for an infection risk management mode (IRMM), which applies during identified periods of elevated disease transmission risk. Authorities having jurisdiction can determine when the enhanced protections of Standard 241 are required. Resilience (the ability to respond to extreme circumstances outside normal conditions) in indoor air quality control design and operations is introduced.

**Requirements for Equivalent Clean Airflow Rate** – Sets requirements for equivalent clean airflow rate target per occupant of pathogen free air flow, reducing the risk of infection.

**Requirements for Use of Filtration and Air Cleaning Technology** – Provides extensive requirements for use of filtration and air cleaning (such as HEPA filters, air ionizers, or UV lights) to achieve equivalent clean airflow requirements and be cost effective effectively and safely.

**Planning and Commissioning** – Provides assessment and planning requirements for being ready for the times when there is an event with increased disease-causing pathogen transmissions. The standard has a building readiness plan, that documents procedures for assessing existing or new HVAC systems to determine if they are working properly and attributing to the equivalent clean air delivered to spaces. 

*For additional details or to purchase Standard 241, visit [ashrae.org/241](http://ashrae.org/241) or contact the ASHRAE Customer Contact Center by phone at 1 (800) 527-4723 or by fax at (678) 539-2129.*

THE CHIEF ENGINEERS ASSOCIATION OF CHICAGOLAND

# Golf Outing

83RD ANNUAL

FRIDAY, SEPTEMBER 8, 2023

**SHOTGUN START  
MAIN EVENT DINNER  
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*Cog Hill Golf Course*

Shotgun Start 9am

Course assignments will be sent the week prior; check in at the course



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For questions, contact:

Kevin@TheStone.Group    Brendan@TheStone.Group

★ ★ ★ ★    **SPONSORSHIP OPTIONS**    ★ ★ ★ ★ ★

*Sponsorships include: One dinner and two drink tickets • The ability to set up a display table to mingle with guests • Signage and promotion throughout the outing*

- \$3,000**    Dubs Special One hole sponsorship and one foursome
- \$900**    Par 4 or 5 hole sponsorship
- \$1,000**    Par 3 Hole sponsorship
- \$1,600**    Double course hole sponsorship (par 4 or 5)
- \$3,000**    Tee Off Bloody Mary Bar (limit 2-bar at registration)
- \$3,500**    Lunch sponsor at Halfway House (limit 2 per halfway house)
- \$6,000**    **Dinner Sponsor**
  - Company name on banner in tent, can set up table in dinner tent
- \$1,000**    **Drink Cart (limit 4)**
  - Cart will be branded with company info
  - Sponsor can provide koozies or a small handout to be distributed
  - Cog Hill employee to drive the cart
- \$125**    Additional dinner ticket

## GOLF PRICES

Price includes cart, breakfast or lunch ticket, dinner, and drink tickets.

### Course 1 & Course 3

\$300 per golfer • \$1,200 per foursome

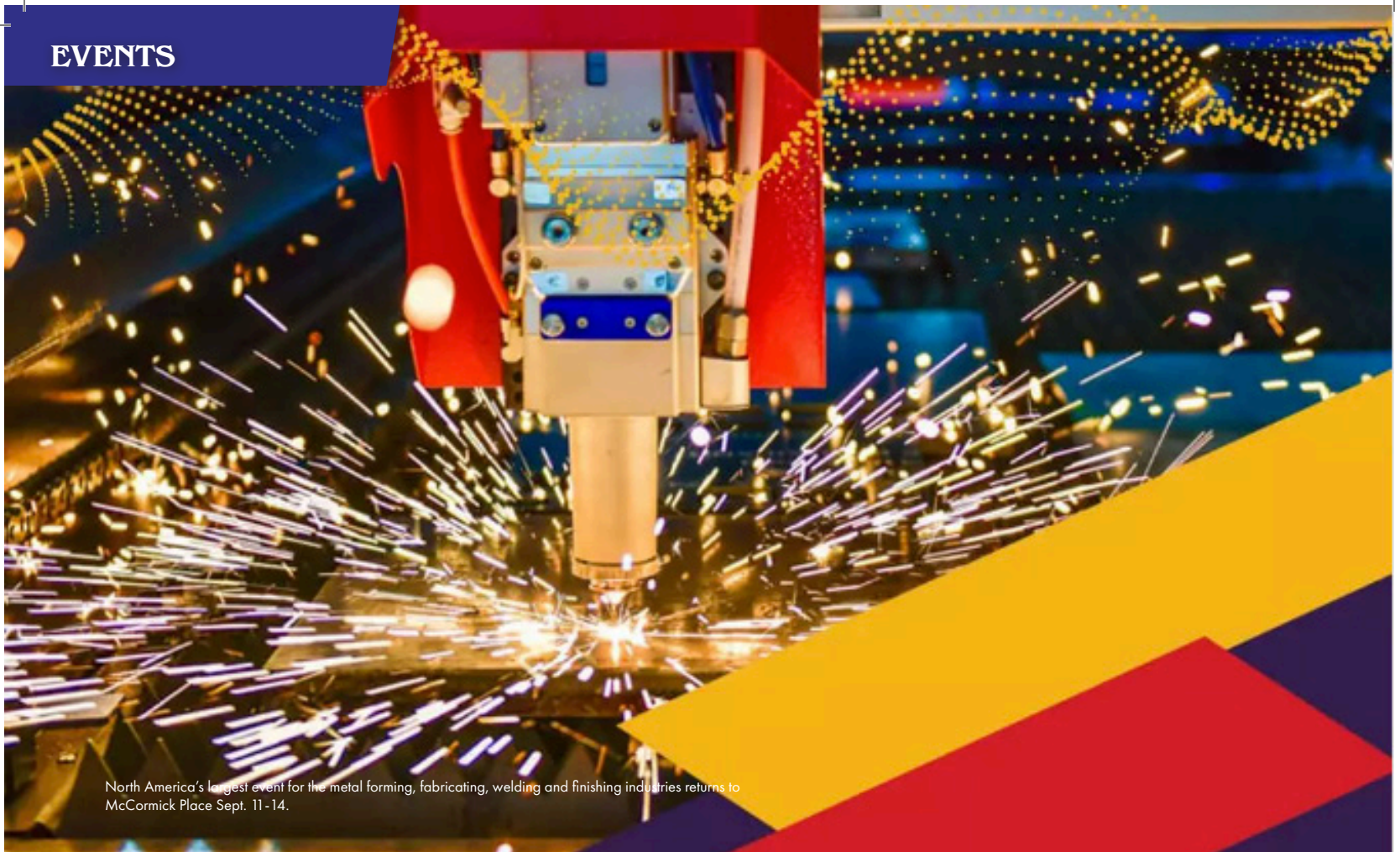
### COURSE 2 - Ravines

\$450 per golfer • \$1,800 per foursome

### Dubs Dread

\$500 per golfer • \$2,000 per foursome

 **The CHIEF ENGINEERS  
Association of Chicagoland**



North America's largest event for the metal forming, fabricating, welding and finishing industries returns to McCormick Place Sept. 11-14.

### **FABTECH Chicago 2023**

Sept. 11-14, 2023

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Chicago, Ill.

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### **FABTECH 2023 Special Events**

Numerous special events are scheduled for FABTECH 2023. While at the show, plan on attending the keynote presentations and leadership exchange panel discussions held in the FABTECH Theater. All events are free and open to all attendees unless otherwise noted.

### **FABx Tech Talk Highlights**

This year's powerful lineup of speakers includes visionary leaders who are driving manufacturing forward. Hear these experts share insights on the latest innovative trends and technologies that are improving the metal fabrication industry, and how to transform your leadership to drive results.

**Monday, Sept. 11, 12:30-1:30pm**

### **Panel Discussion: Leadership Exchange: Advanced Manufacturing: Trends and Technologies Changing the Future of Metal Fabrication**

Businesses need to embrace new technologies and innovations to keep up with customer demands and stay competitive. This discussion will offer a panel of diverse technology experts who will share the latest innovations in technology shaping the future of the fabrication industry.

**Tuesday, Sept. 12, 8:30-9:30am**

### **A Nasty Bit of Rough With David Feherty**

Hilarious and outspoken, David Feherty brings joy and smiles to audiences across the country. In addition to being golf's most in-demand commentator and analyst, Feherty is one of the strongest advocates for U.S. troops in the line of duty as well as when they return home. David will be bringing his sharp wit and colorful personality to FABTECH to share great life stories and behind-the-scenes moments from life on the PGA Tour.

**Wednesday, Sept. 13, 10:30-11:30am**

### **Panel Discussion: Exploring Welding Apprenticeships and Talent Development**

Be a part of an enlightening panel discussion that explores the realm of welding apprenticeships and their pivotal role in shaping the future of skilled welders. Uncover the advantages of practical training, the evolving requirements of the welding industry, and the pathways to a fulfilling career in welding. Bring your aspiring trade students to this one!



**Thursday, Sept. 14, 8:30-9:30am**

**Panel Discussion: State of Manufacturing 2023**

The manufacturing industry faces new opportunities, challenges and trends each year, captured in Fictiv's annual State of Manufacturing survey of industry leaders. Join a select panel of industry experts to unpack and discuss the survey findings, and to share insights on key trends impacting the manufacturing industry this year to help you navigate 2023 and beyond.

Key takeaways include:

- Discover insights from leaders on key trends in the manufacturing industry this year
- Examine new avenues of global supply chain diversification
- Learn how to boost productivity in the face of engineering workforce shortfalls
- Explore Artificial Intelligence (AI) and its impact on manufacturing
- Consider the merits of sustainability in manufacturing and digital manufacturing implementation

For more information about the events and opportunities available at FABTECH Chicago 2023, or to register, visit [fabtechexpo.com](http://fabtechexpo.com).



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## Water Research Team Completes Pioneering Nutrient Removal Study

A team consisting of WSSC Water, Brown and Caldwell, and Northwestern University has published research to revolutionize cost-effective, environment-safe nutrient removal at water resource recovery facilities (WRRFs). The \$300,000 research project, Demonstration of Progressive Carbon Efficient Nitrogen with Biological Phosphorus Removal in a Conventional BNR Facility, funded by The Water Research Foundation (WRF), sought to study lowering operating costs of biological nutrient removal (BNR) systems while fully utilizing existing infrastructure.

Introduced in the 1970s, BNR techniques have been subject to scrutiny due to high energy demand, reliance on external chemicals, and economic and environmental sustainability concerns. Given these challenges, many utilities worldwide operating conventional BNR facilities are in dire need of innovative alternatives to meet stringent nutrient limits.


To this end, full-scale research at WSSC Water's 26-million-gallons-per-day Seneca WRRF in Montgomery County, Md., addressed this need by demonstrating how efficient management of influent carbon, coupled with simultaneous nitrification and denitrification and post-anoxic denitrification, can reduce both energy and chemical usage while still meeting nutrient standards.

By utilizing ammonia-based aeration control to maximize influent carbon utilization rather than aerobic oxidation, the facility decreased its energy use by lowering the aeration demand and blower runtimes, and reduced the need to purchase additional carbon for denitrification, thus lowering its carbon footprint.

Furthermore, the research revealed that low-dissolved oxygen conditions can effectively facilitate combined biological nitrogen and phosphorus removal, thereby reducing the need for high-volume mixed liquor recycling, usually as high as four times the WRRF's flow.

Through this demonstration process and subsequent full-scale implementation, the Seneca WRRF is on track to save its annual energy and chemical costs by approximately \$575,000 as it continues to meet nutrient removal requirements.

WSSC Water is considering deploying the innovative cost-saving strategies throughout its other five WRRFs to maintain affordable and sustainable service for its 1.9 million customers.

"We congratulate WSSC Water for their unwavering commitment to providing safe and reliable water to its customers and returning clean water to local waterways," said Brown and Caldwell's Dr. Pusker Regmi, a principal research investigator. "This study is a game changer for the water industry as we collaborate with utilities and academia to find the most effective, sustainable, and economical ways to enhance nutrient removal practices while protecting the environment." 



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# BluSky Chicago Office Succeeds in Packing 101,000+ Life-Saving Meals

More than 350 community member volunteers gathered at BluSky's facility in Rolling Meadows to pack more than 101,000 life-saving meals for starving children in the developing world.

ROLLING MEADOWS, Ill. — BluSky Restoration Contractors, LLC, a leading national property restoration company in the U.S., and hundreds of community members recently worked to feed thousands of starving children in the developing world. Through a partnership between BluSky and Feed My Starving Children (FMSC), volunteers set a goal to prepare more than 101,000 life-saving meals at the FMSC MobilePack event. BluSky was pleased to announce that this goal was met, and thousands of children around the world will benefit from this day of volunteerism. The MobilePack took place at the BluSky Chicago-area campus, at 3200 Squibb Avenue, Rolling Meadows, Ill.

More than 350 community member volunteers came to BluSky's facility to generously give their time. Volunteers packed 468 boxes of specially formulated food, designed to meet the needs of severely malnourished children. This is enough to feed 276 children every day for an entire year. Lively music was played, a gong sounded when each station finished packing a box, and fun was had by all. At press time, BluSky was still waiting to hear where the food was to be safely delivered by FMSC.

This was the fourth FMSC MobilePack hosted at this facility; prior to merging, J.C. Restoration hosted in 2016, 2017 and 2019, having packed a total of 342,144 meals. In addition to community members, friends, and clients of BluSky lending a helping hand, BluSky would like to extend a thank you to all of its sponsors: Flood Brothers, Enterprise, Paycheck Solutions, Aramsco, Storm Electric, Daniel Lesus Architects, M&M Electrical Contractors, First Centennial Mortgage, Howard M. Zavell Dickler, Kahn, Slowikowski & Zavell, Ltd., JGW Construction, BH Construction & Flooring, Inc, Ray's Plumbing, and Agents Insurance Services.

"Giving back is of tremendous importance to everyone at BluSky, and to have had the opportunity a fourth time here locally to make an impact such as this for these children is remarkable," remarked Steve Rost, Chicago office vice president. "We are so humbled by this experience, and are beyond grateful to our staff, friends, and sponsors for their assistance in making this a success. We are looking forward to doing this again next year." 📷



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# Up & Coming Engineer: Matt Eng

Working Hard, and Hardly Slowing Down

By Kate Gawlik

Born at Northwestern Memorial Hospital and living on the city's North, South and West sides during his life, Matt Eng is a Chicagoan through and through. Another trait at Eng's core is engineering.

"I've wanted to be an engineer my entire life, though I wasn't sure what kind I wanted to be," Eng says. "I previously was in the field of industrial engineering, but it became less interesting. Then I found my way to becoming a Local 399 engineer."

Eng joined Local 399 in 2015 when he started taking classes at the Union Hall. Soon after, he joined Hines to work at the River Point office tower. After two years of apprenticeship while taking classes at the Union Hall, Eng received a Stationary Engineers License in 2018. Also that year, Eng earned a Facilities Engineering Technology Degree from Triton College.

Working with Hines at One South Dearborn was Eng's next ambition, along with classes at the Illinois Institute of Technology (IIT), where Local 399 has an established partnership. Eng earned Bachelor of Industrial Technology and Management and Master of Industrial Technology and Operations degrees from IIT. He currently is a stationary engineer at One South Dearborn.

Eng's engineering ambition has not stopped, as he recently took on an adjunct professor position for the education department at the Union Hall.

As a professor, Eng strives to improve his students' skills while he hones his own. He is excited about the emergence of new technology that can help the industry become more efficient and dependable.

"With new technology, we will be able to help building owners save money by cutting down on certain parts of daily operations while also making equipment that has a longer lifespan," Eng says. "I see that smart buildings are becoming more of a trend in newer buildings, as it helps run the building more smoothly while calculating data to help with costs of operation."

Anyone established in the industry should be on the lookout for Eng as he continues to make an impact as he learns. For those new in the field, Eng will guide his peers along the way.

"If you are looking to move up in the field or are looking to gain more knowledge of what else there is you can do, I recommend the IIT program as it opens your mind to other things you don't see on a daily basis," Eng says. "You'll also learn how to put these processes together to achieve bigger goals."

This approach fits well with the Chicagoan's overall way of life, saying people should "Always strive to learn new things and help others because you might be the one who needs help one day."

Patrick Wawrzyniak, a board member with the Chief Engineers Association and a member of the Political Education Fund at Local 399, could not agree more with that philosophy, saying, "Anything is possible through discipline, hard work and dedication. I think that describes Matt very well."

*Kate Gawlik writes about construction, design and business trends from Lockport, Ill.*



Matt Eng joined Local 399 in 2015. His ambition has earned him bachelor's and master's degrees from IIT, and a spot as an adjunct professor at Union Hall.

## Best Practices: Continuity Planning

August in Chicago — one of the hottest times of year for this city, and one that requires great care and planning. With our HVAC units working overtime to keep our buildings' tenants comfortable and content, it's not impossible that the demands they make on the power grid can overreach what the grid can deliver, resulting in outages that can affect not only our buildings and their tenants' comfort, but can lead to conditions they might not immediately think of, like breakdowns in communications, a need for infection control, fire safety concerns and more.

This month, we're looking at how we can best maintain a continuity program that ensures that your tenants and their facilities remain safe, functional and comfortable. The simple answer to the question of how to best do this is to plan ahead and be prepared. The more detailed answer is, of course, a lot more complicated — even more complicated than these pages will permit — but we feel it's important to review this train of thought at this time of year in particular.

In advance of any outage emergency, you'll want to take care of everything on this checklist:

- Establish and exercise the Incident Command System (ICS) for your site, if using ICS — see Fig. 1.
- Ensure that your facility has an emergency response plan for evacuation in place for your facility, and that everyone knows it.
- Identify your clients or tenants for whom power disruption entails elevated risk, such as those requiring oxygen, electrical suction, mechanical ventilation and so forth.
- Have a relocation plan in place that facilitates the movement of clients to an alternate location with interim provisions for care, taking into account those requiring assistance, such as the elderly, the infirm or others with compromised mobility.
- Consult your appropriate responsible personnel or service regarding your IT continuity plan, employing your Contingency Planning Template.
- Keep up-to-date staff fan-out lists, including support, facility/maintenance and clinical staff contacts so that everyone can stay informed as quickly and efficiently as possible.
- Ensure that all of your most critical contact lists are up to date, such as your energy services provider, your property manager, any site-specific emergency contingency services, etc.
- Ensure that your site-specific manager on-call number for each zone is available.
- Conduct regular drills and exercises highlighting loss of power and Code Green-Evacuation situations.
- If your facility maintains one, ensure that its backup generator is able to provide support to core building

systems such as heating/cooling, air handling, and any other systems necessary to the conducting of onsite business.

- Test your backup generator according to manufacturer specs on a regular basis, ensuring that an adequate fuel supply is available should the outage last for an extended period.

### Have Communication Protocols in Place

Being prepared for the contingency of an outage is imperative, but it's equally important to know what to do when an outage occurs. If the power should go down at your facility, you'll first want to determine the likely cause. It could be a general loss of power to the community, a scheduled shutdown at your facility, or it could be weather-related, due to failing equipment, some malfunction due to human error, or even a combination of factors.

Whatever the cause, an outage calls for immediate action. Whoever discovers the outage should immediately notify the supervisor or manager on duty, who in turn should confirm and prepare to issue a status report to site-specific leadership on all impacted areas throughout the facility. Once the causes and effects are determined, communicated and agreed upon, a plan of action can be set in motion.

As soon as possible, an incident commander should be determined, and details regarding the outage should be noted and forwarded to everyone on your team who needs to know. This should include the date and time of the outage, amount of time elapsed to the present message, details on which of the facility's areas are affected, and any other pertinent information.

If the paging system in the building can still function via auxiliary power, an overhead page should be drafted and broadcast to the facility as quickly as possible, or, in the absence of such a system, arrangements should be made to inform everyone about the outage, and to let them know that the situation is being worked on. Any staff encountering issues or concerns in their areas should report them immediately to their supervisors or managers, especially their situations require assistance.

Effective communication in these circumstances is absolutely vital. A power outage offers enough confusion for everyone involved without compounding the difficulties through bad or non-existent communication. Your local energy service provider should be notified — ComEd, NICOR and/or any others relevant to the situation — as well as local police, fire and emergency medical services, and any senior facility management personnel not already aware.

Offsite personnel also should be brought into the loop, and clients likewise should be advised of the adversity affecting your facility so that they can plan accordingly. If necessary, family members, guardians and other relevant individuals

should be informed as well. Ongoing updates should be supplied at regular intervals to all relevant stakeholders, and the site-specific reportable incident form should be filled out when its criteria are met.

### **Incident Command Responsibilities**

Communication will remain crucial throughout the incident, so maintaining contact with facilities and maintenance will remain a priority, but as soon as possible, your incident commander will want to see to it that backup power is activated, provided your facility has auxiliary power to start with. It's imperative to confirm that it's up and running so that other critical systems can continue to operate as needed, and that any such equipment that needs to be plugged into special emergency outlets, is.

For precaution, it's also a good idea at this point to ensure that all clients and visitors to your facility have been notified of the outage and the situation as appropriate, and that they have been moved to a safe area to prevent any accidents or unnecessary liability. Tenant and visitor safety should always be on your mind in this sort of emergency. Along with the respective floors of your building, elevator functions should be checked, along with whether or not any people are perhaps trapped inside.

Depending on the specifics of your building, there likely will be at least some things you'll want to check on to see how they might have been affected by the outage, even if the interval before auxiliary power came on was relatively short. Fire monitoring, suppression and alarm systems, for instance, should be checked as part of your fire watch protocol. If there are any areas in your building that are specifically secured by an electrical system, you'll want to double check that they have held. For instance, if your facility has a lockdown area for prisoners or dementia patients, this is something you'll want to explore almost immediately.

On a pragmatic level, as part of your loss-of-water plan (see [tinyurl.com/epa-loss-of-water-plan](http://tinyurl.com/epa-loss-of-water-plan) for a guide on developing your own plan should you need one, or require a review), you'll want to check your water system circulation pumps and make sure that everything is functioning as it should. You'll also need to check in with your IT department to ensure that their systems are operational and secure. To that end, you'll also want to turn off unnecessary lighting and computer equipment during the outage to prevent a surge from occurring when power eventually returns.

Things like refrigerated food storage should remain closed to retain the cold temperatures inside as well as possible. If the outage is extended and food needs to be made available, menu plans should focus on food preparation that doesn't involve cooking or heating. But cold food storage should remain closed unless absolutely necessary, or to move foodstuffs to proper refrigeration. If you're in for an extended siege of power loss, an assessment should be made of the

food available onsite, and how many personnel must be fed, and if a food rationing plan needs to be put into effect.

At some point, an assessment will need to be made regarding the likely duration of the outage, and further protocols put in place regarding the ability of the facility and its personnel to function under such conditions for an extended period of time, if necessary, and whether or not the site might eventually need to be evacuated altogether. But if it's possible for operations to continue, a determination will need to be made about for how long.

### **Power Recovery Checklist**

Once power is restored either in part or in full, either through an overhead page system or by other means, an announcement must be made as soon as possible to inform everyone onsite that the water supply is back online, but that the water must be assumed not safe to drink until otherwise notified, to prevent anyone from ingesting harmful bacteria or other pathogens. Signage should be posted on bathroom doors and by any water fixtures available in the facility to prevent anyone from using them and ending up sick. After any required samples are taken as needed, all water lines then should be flushed to ensure their safety going forward. Samples can be given to Environmental Public Health officers for testing. Any integrated fire sprinkler systems also should be tested.

Overall, Facilities and Maintenance Engineers will coordinate the facility's return to normal operations. If the power and water have been out for an extended period of time, the water may run "dirty" for a time. All onsite personnel should be advised of this.

Once everything is up and operational again, the Site Director or Administrator should conduct a debriefing of the incident, whatever is known about what precipitated it, and how the emergency action plan was followed once the outage occurred. Notes should be made on any vulnerabilities or breakdowns in the plan and its execution, so that they can be corrected for possible future emergencies. A report should be drafted that encompasses all of this information, and submitted to appropriate facility personnel.

This is far from a comprehensive action plan for your facility, but at this time of year when Chicago heat often is at its worst, it's intended to refresh your memory of how vital it is to be prepared for power outages in the event that soaring temperatures and overloading of the grid by area HVAC systems should require it. Reviewing your plan now, while the power is still on, is preferable to having to refresh your memory by flashlight in the moment of crisis. And even if power is well maintained all through this often exceptionally warm season, you'll feel better knowing that you're ready for the worst.

Sources:  
[www.phe.gov](http://www.phe.gov)  
Continuing Care Safety Association

## Rise to a Higher Level of Training

By Michael Badame

As chief engineer of your facility, you are continuously challenged to increase operational efficiency, improve safety, and avoid operational impacts to your company, whether human or machine-related.

Communication with team members, contractors and tenants are all critical. Coordinating site visits, attending construction meetings or briefing the next shift for operations takes up the majority of a chief engineer's time — and costs money. If everyone isn't on the same page during these activities, they sometimes have to be repeated, and we all know how unpleasant it is trying to communicate something more than once.

Asset lifecycle management is being accomplished on a day-to-day basis, which includes planning, acquisition, operations/maintenance, and decommissioning of systems. This is typically done through a combination of documented practices or procedures, and a few software suites that can handle individual tasks fairly well. You may also have a full-on asset management software program for preventive and corrective maintenance. Either way, asset lifecycle management captures a broad spectrum of activities, from simply tracking work procedures to enterprise-level solutions that can predict problems before they occur.

Training staff on new and existing equipment can be cumbersome, and planning for knowledge transfer from senior staff to the next generation of operators takes some careful thought and good strategy. If a smooth transition is expected, a solid training program will have to be a part of the plan. Paging through an operation & maintenance (O&M) manual is no longer the single source of training material at our disposal. The way we learn or teach is changing, but in a good way. Using more senses during a training session through video, audio, and even a combination of both brings us closer to the real-world environment and improves knowledge retention, helping to maintain a highly skilled workforce.

When you're looking at these challenges from a 10,000-foot view, a holistic approach is difficult to envision. This is especially true when we run into multiple operational issues with limited resources while facing budget constraints. That is where technology, like AETOS OPERATE, comes into play. I had the pleasure of speaking with AETOS Director of Sales Scott Thomas, who has been with the company since 2021. Scott provided detailed insights into their flagship platform, AETOS OPERATE, which offers a synergistic approach to managing our day-to-day operations.

In October of 2022, AETOS performed a 3D scan of IUOE Local 399 Operating Engineers Technology Center equipment and classrooms. "The software is working out well for our use

goal as a marketing tool on our website," says Jim Coates, EDU training fund administrator for Local 399. "In the future, we may leverage the equipment scans in the classroom lecture and training. The 3D imaging is versatile and can be used in many ways. The learning curve was comfortable for how we use the software."

### Expanding the Toolbox

AETOS OPERATE transforms your operations by bringing the operating environment into a 3D digital twin or visual maintenance management system (VMMS). By utilizing VMMS technology, businesses can identify potential issues before they become major problems, resulting in improved efficiency and reduced downtime.

AETOS uses lidar technology to perform a 360-degree Matterport scan of a facility to provide a 3D virtual model, or digital twin, of every mechanical room, space and asset in a building. Having a navigable digital twin of your facility enables you and your team to see their entire equipment database, including inspection histories, nameplate data, operation and maintenance (O&M) manuals, service records, training videos and standard operating procedures. This information is embedded into the software and can also be integrated with your computerized maintenance management system (CMMS) and geographical information system (GIS) database. Planning for small-scale equipment upgrades or multiyear capital improvements projects can be strategically accomplished through visual equipment databases that allow for tracking of key performance indicators to trigger when equipment is out of warranty or past its useful life expectancy.

### Operations Management

With a 3D 8K high-definition scan of your facility, you can virtually tag, label, and organize all equipment and systems to help keep your workforce prepared. This helps to ensure that all critical and non-critical data is easily accessible in one centralized location. Within the database, you can track maintenance schedules, repair histories, and any other important data needed to help keep your equipment and systems running at peak efficiency.

AETOS OPERATE also has the ability to integrate with Internet of Things (IOT) devices and to feed live data into your 3D facility environment, enabling you to proactively find equipment issues before they cause operational impacts to your company. You can take preventive measures for job-specific safety hazards, or perform a job hazard analysis (JHA) by carrying out simulations of upcoming work activities or major equipment replacements. Visualizing the site as a team can reduce the number of potential safety issues and help to form a solid safety plan before proceeding with any work.

### Learning Management

The system has a learning management tool that provides users with a site-specific guided experience. You can create



custom knowledge checks, quizzes and training procedures best suited for your operations, keeping your operators on the leading edge of technology. Operators can practice standard or emergency operating procedures without any impact or disruption to operations. This includes performing safety drills, leading to reduced response times and improved situational awareness, instilling a greater level of confidence in your operators.

At any point in the training sessions, operators can be assessed on their understanding of the equipment or procedures, helping you to tailor training modules so operators can gain mastery of their systems. The chief engineer can also generate reports to gain insights into group or individual skills and competencies.

### Project Management

Built-in video conferencing technology enables users to directly engage with your building's 3D scans online, which transforms the way we interact with designers, contractors and operations staff. With this technology, users can collaborate in real-time from different locations as if they were walking through the facility with a single point of focus. Better resource allocation can be instantly recognized by using a virtual replica of a space to help operators determine what specific tools, equipment and materials may be required for a job. This also opens the opportunity to work with a wider pool of architects and engineers, which offers a multitude of benefits. Contractors can be notified of project issues during the construction or commissioning phase of a project simply by "@mentioning" them in a comment regarding a particular piece of equipment or system with all relevant data. Using the "@" symbol with their name automatically sends a message to your team member which brings them up to speed on your operations.

### Versatility & Compatibility

AETOS OPERATE is versatile and can be used across multiple industry types, including manufacturing, industrial, office buildings, hospitals, hotels and educational facilities. Its multi-functionality extends to various devices, such as desktops, laptops and auto-scalars for Android or IOS on mobile devices, making it an ideal choice for different work environments. Their API allows for seamless integration of your existing CMMS. Single sign-on (SSO) is available, and the platform is hosted on SOC-2-compliant Amazon Web Services (AWS) servers in the United States, ensuring top-notch data security.

### Support & Custom Solutions

AETOS OPERATE has staff available on a 24/7 basis. They offer tiered plans that range from small pilot projects to full-scale enterprise solutions. Scott Thomas also mentioned custom solutions in which AETOS works with your company and team members to create customized software configurations to meet the specific needs of your facility.

Jacob Ruppel, Chief Engineer with Portman Holdings, found

his solution by embracing technology, saying, "Working with AETOS has been a game-changer for our facility management team. The operate platform has completely transformed the way we handle asset tracking, maintenance and collaboration. The immersive 3D experience has helped us identify and resolve potential issues before they become major problems, saving us both time and money. AETOS truly delivers on their promise of streamlining operations and enhancing efficiency." ■■■

Michael Badame is a Writer, Operating Engineer, and Instructor at IUOE Local 399 Operating Engineers Technology Center.

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# History & Domestic Hot Water Systems at the Palmer House Hotel

By Patty Murray

When it comes to hospitality, nothing quite compares to the hotel choices in our city of Chicago. From sleek modern hotels on the river to centralized spots on the Magnificent Mile the choices are truly endless. But no Chicago hotel compares in history and charm like the Palmer House hotel. A Hilton Hotel, the Palmer House is located in Chicago’s loop and boasts 24 floors, 1,641 guest rooms, nearly 130,000 square feet of meeting space, three ballrooms, and a nearly 17,000 square foot exhibit hall. The Palmer House is inarguably a Chicago staple. With nearly 150 years of history, the Palmer House is a member of Historic Hotels of America and is a Chicago Historic Landmark.

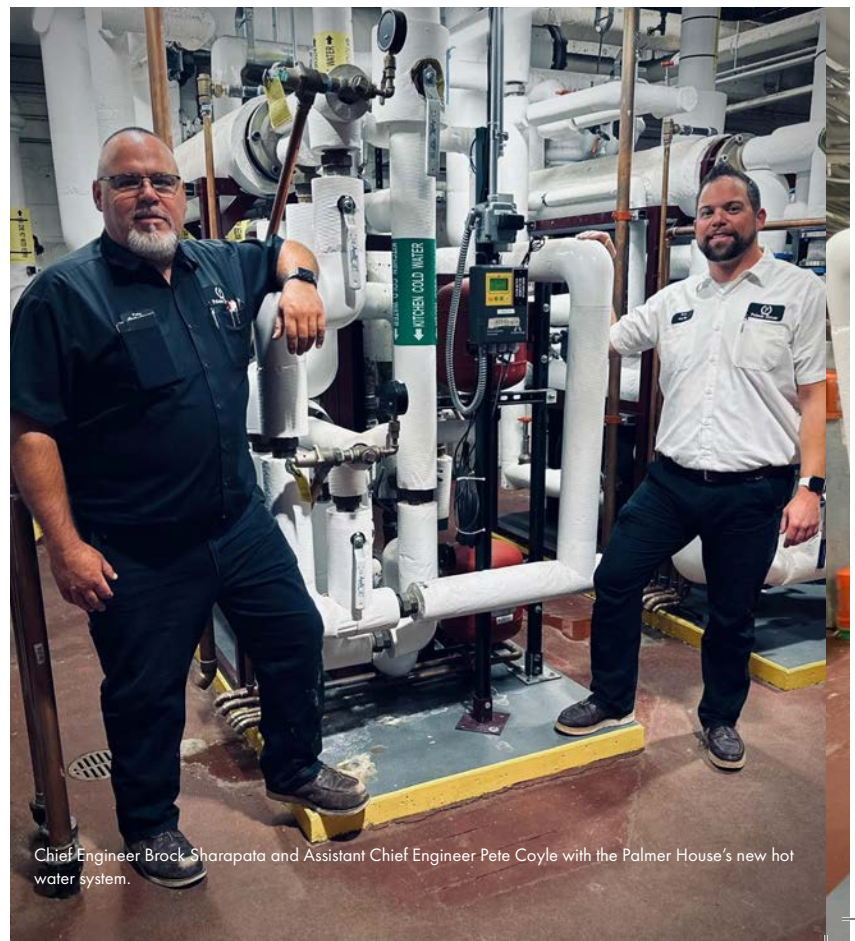
## Rich in Chicago History

The Palmer House was originally an act of love — an elaborate wedding gift from businessman Potter Palmer to his bride, Bertha Honore. Shortly after its grand opening, the original hotel fell victim to the Great Chicago fire of 1871. This unfortunate event did not dampen Palmer’s drive, and he immediately set to work rebuilding the hotel. Ensuring a prompt return of the Palmer House, Palmer provided special lights and gas fires so construction could be carried on throughout the nights. The current Palmer House that sits on nearly a whole city block in the Loop is the fourth hotel to hold the name — never closing during its construction and making it known as the nation’s longest continually operated hotel. It is no surprise it has housed some of the world’s greatest, including Frank Sinatra and Oscar Wilde.

## Providing Modern Comfort While Preserving History

Providing top-notch service and luxury to a hotel this size is no easy task. Over the last few years, the Palmer House underwent a \$170 million renovation. Much of the hotel was revamped, including windows, lights and the pool. Although the outside features received a makeover, one of the most important changes took place within the third sub-basement of the building — a replacement of their domestic hot water system. A project of this nature for a building as large as the

Palmer House hotel is no easy task and takes time. Assessment of the domestic hot water system initially took place in June 2016 by Armstrong International team member Hank Lenzen. This domestic hot water system had pneumatic controls and used high-pressure steam. It had steam heat exchangers and contained two 250-gallon tanks. Per Armstrong’s assessment, cold water was fed into the tank and tied in with all the return lines from the distribution loop. Then that water was tied to the shell and tube water heaters, which fed the distribution out to the guest rooms at a higher temperature in order to overcome the temperature loss at the far reaches of the loop. Added sensors were installed to help control the system. Overall it was not an ideal nor the most efficient way to control the domestic hot water system and keep the temperature at a safe level.



Chief Engineer Brock Sharapata and Assistant Chief Engineer Pete Coyle with the Palmer House’s new hot water system.

## Modernizing the Domestic Hot Water System of a Historical Building

After much assessment and planning, it was decided that it would be best to completely reorganize the Palmer House hotel's domestic hot water supply system. Designed by Armstrong specifically for the Palmer House, a fourth-generation digital domestic system was designed. There are three systems — the lower zone, the kitchen zone and the upper zone — all of which are completely tankless. This saves space by taking up only ¼ of the floorspace compared to the previous system. The water is in continuous recirculation to keep water moving throughout the piping. The Armstrong system is also designed to eliminate the causes of Legionnaire's disease. Additionally, it was established that an automated system would be the most efficient, providing considerably fewer mechanical failure points than their previous domestic system. Being connected to the building's automated system allows it to be monitored from anywhere, any hour of the day. The main point of the new domestic hot water system that controls the temperature is referred to as The Brain — a digital master mixing valve. Per Armstrong's website, The Brain improves system performance and safety by delivering a consistent pre-set temperature to the point of use. The upper zone has three of these Brain mixing valves and three of some of the largest heat exchangers Armstrong manufacturers. The lower zone and kitchen have two of each. If any problems occur, the system will turn to safety mode within seconds. It also updates itself every two seconds. This system eliminates any pneumatics, any control valves, and operates on low-pressure steam. It is an ideal system for such a large and historic building.



The platform in place, ready for the new system to be installed.

## Out With the Old and In With the New — But How?

Now that it was decided what kind of system to use, Armstrong, Palmer House hotel's Chief Engineer Brock Sharapata and the engineering staff were faced with their biggest challenge yet — how to properly remove the old system and put the new system in place, with home base being the third sub-basement. Much like the origin of the hotel, implementing this new domestic hot water system was very much a labor of love. Preparation involved measuring every space, elevator, entryway, doorway and hallway that would be in use during the removal of the old system and installation of the new system, ensuring that everything would fit. Another hurdle they faced was the construction of the new system. To maintain the integrity of the new system, it was built with a modular design to be shipped to an offsite facility where it was dismantled. It was then shipped and rebuilt in the Palmer House hotel's third sublevel basement where it resides today. Demo of the old equipment involved bringing in a separate team of professionals who were able to properly handle removing the old, asbestos covered piping. All this took patience, planning and good communication by everyone involved — especially Armstrong's representatives, the Palmer House hotel's chief engineer, Brock Sharapata, and his engineering staff. Fully functioning in early 2023, the new domestic hot water system in the Palmer House hotel provided by Armstrong is a phenomenal upgrade for a phenomenal Chicago landmark. 📷 📷

*Patty Murray spent nearly 10 years working in the IUOE Local 399 Membership Department. She is the daughter of Jim Murray and sister to Michael Murray.*



New insulated piping replaced the old, asbestos-covered piping, the removal of which required a specialized team of professionals.

## Growth and Gratitude — the Door Service, Inc., Story

By Karl J. Paloucek

You know that expression about how God doesn't close one door without opening another? It's usually intended as a metaphor, but in the case of Rodney Dunlap, president of Door Service, Inc., his early days before re-establishing Door Service, Inc., offered a literal example of this phrase in practice.

Dunlap grew up in the industry, he says, learning the trade along with his cofounder father and his partner, his uncle and other family. But after a decade or so, his father decided to leave the partnership. "He went back to work for a competitor of his, and then his partner shut this company down," Dunlap recalls. "The namesake, Door Service, Inc., was insolvent with the state of Illinois for the last 25 years, give or take — 30 years? Maybe even longer. Maybe 35 years. My wife bought the name back for me. At the time, I didn't know she had done that — I was working for somebody else, also and I found out that [the business] where I was, was for sale."

This was an opportunity for Dunlap. At the encouragement of the then-owner of Althoff Industries, he decided this was the sign to start his own business. "'Rodney, why don't you start your own business? Or buy out the guy you work for?'" he remembers Althoff saying at the time. "I said, 'Mr. Althoff, I don't know how to run a business.' He said, 'I'll back you up. I'll give you up to \$30 million, and I'll back you up and support you, and train you on how to be a business owner.' And I said, 'That sounds like a fair deal to me.'"

Armed with his abilities, his industry knowledge, his contacts within the industry, and the promise of Althoff's support, Dunlap approached the owner of his workplace and extended his offer, telling him with confidence, "I heard you're for sale, and I'd like to sit down with you and talk to you about buying out this company, and keep you on board as the CFO and general manager, and teach me the back end of the business." With a bit of a smile, the owner turned on his heel and walked off the job site, presumably to think about the offer.

The deal did not go as planned.

"About a week and a half later, we were in a team meeting," Dunlap says. "I walked into the meeting and everyone was laughing, and I said, 'What's so funny?' and everyone — 35 people — turned to look at me and said, 'You think you can buy this company and run it? You're the joke today. You're the joke. You can't do this!'"

"So I quit right there," he continues. "I turned and walked out. ... The owner of the company called me back up and apologized, and I said, 'I'm your best tech you've ever had. Your best installer, your best service technician, the best at everything we do in our industry. I'm a 40-year-old man, and

you just shamed me in front of a bunch of people?' I said, 'I can never work for you again, and I'm going to run you right over, now.'

Dunlap insists that he is not a vindictive sort of person — but that the incident motivated him to do what it would take to succeed in the industry he knew so well. In the end, he never took Althoff up on his offer of financial backing. Instead, Dunlap and his partner started with no more than \$2,000 and the word of a trusted friend who promised to do everything she could to support his efforts if he struck out on his own.

"It's been a vertical up since the day we started it," Dunlap says, "and one person, since we started it, is responsible for opening the door for me. Narvella Williams is her name. She literally introduced me to the keys to the city of Chicago."

The very first day they that the newly re-established Door Service, Inc., opened its doors, they had four service calls. It was a great start that provided the momentum they needed right at the start, enabling them to completely forgo borrowing any money from their most-generous supporter. But they did accept one grand gesture from him.

"Mr. Althoff offered me a building to use for free, for two years," Dunlap says. "That gave us the space to grow even more, and then it just kept getting bigger and bigger, and we started getting more and more complicated jobs, and larger buildings as clients."

Eventually, as business grew, along with the reputation of Door Service, Inc., in 2016, Dunlap would cross paths with someone who would have a tremendous impact on its future: Jim Ollry.



A revolving door job well done at 1000 W. Fulton Market.



Robert and Rodney Dunlap share a moment of brotherly solidarity atop one of their installations.

"I met Rodney and told him if he ever needed me down the road, I know a lot of the buildings, I know a lot of the engineers, because I'm one myself," Ollry recalls. "And also, that I could probably help him along the way to get us work, and troubleshoot issues at different buildings, and how to go about it. And so far, it's been working out great."

"That's understatement of the year," Dunlap counters. "Some people are born to do lots of things. Very few people have the discipline to be in sales as a professional salesperson. And Jim Ollry, without any sales training at all, really is the most professional salesperson I've ever met in my life. He stays after me and the entire company, he keeps us on point. He stays on top of sales calls and helps manage the company."

Together, Dunlap and Ollry have tackled some incredible jobs throughout the city. Dunlap describes the Old Post Office renovation as one of the bigger tasks for which they have contracted in recent years. The \$7 million project included a requirement for the rebuilding of five 120-year-old revolving doors by their original manufacturer. "That project took about two years to complete," Dunlap recalls.

Difficult jobs are a specialty for Door Service, Inc., and the pride that they take in this differentiation is obvious. A request from the Arc at Old Colony building at 37 W. Van Buren St. — now a university dormitory — called for them to provide a means to prevent street customers from a Taco Bell newly opening in the building from accessing the dormitory areas through the restaurant. The request involved electrifying a set of 140-year-old Corbin Russwin locks — a highly customized job that almost no one would be willing to take on. So Dunlap

took the locks to a specialty company he favors, located in East St. Louis.

"They said, 'Rodney, why do you always give us the hard stuff?'" Dunlap chuckles — but they did it. "No company wanted to deal with it, so they did it for me as a favor. I had to do some adjusting to them, but we took them back there, removed the doors, bored holes through these antique oak doors, and ran wires through them so that from one side of the building, you cannot get in unless you have a key fob."

"Rodney's got a way of [working] it out," Ollry says. "He'll fabricate it, or whatever it takes. There aren't many owners who will do what Rodney can do. He can do anything. Most people just walk away, but he'll do it — what he says he'll do, he'll do."

Other jobs have included rebuilding all of the big, glass revolving doors and balanced swing doors on the ground floor at the Chicago Mercantile Exchange at 10-30 S. Wacker, handling door replacement as part of the Willis Tower's main floor renovation, and even installing commercial rolling doors on warehouses at Midway, to say nothing of airplane hangar door replacements they've done elsewhere.

But among the biggest clients Door Service, Inc., maintains is Amtrak, specifically Union Station. "We have a 5-year contract with Union Station, for service on all the equipment there," Dunlap says. "Every single thing in that facility, we service."

That includes the anti-terrorist barriers that are installed in the concrete of the in- and outbound ramps accessing the facility. "Many buildings have it," Dunlap explains. "Seventy-One S. Wacker has it. Willis Tower has them, as well. And we service and install those barriers so that if a vehicle is carrying explosives and tries to run into the building down below Union Station to cause chaos, the barrier systems will stop them before they get into a critical area of the facility. A 40,000-lb concrete truck doing 40 mph would be stopped in its tracks."

As Door Service, Inc., has grown and matured as a company, Dunlap and Ollry are both keenly aware that for all of the hard work and innovation they have put into elevating it to its current status, they know they haven't achieved their level of success alone. In addition to Dunlap's wife, company CFO Laura Tomaszewski, "there's a lot of people that have put their lifeblood into my company," Dunlap explains. "Jim and I, Richard Losch, my brother Robert, Mic Griffin — we'll push service contracts toward our clients so we're in the building doing monthly/quarterly/semi-annual/annual PMs on all of the equipment. [Then there are] guys that constantly refer me, like Tommy Phillips — he has gone out of his way to help me with the company, and referrals, and things like that. There's a lot of people who deserve a huge shout-out, for me." ■■

## Smart Building Technology: Connecting to the Future

By Mo Fahim, EIT, FMP, CTPM, CSPO, SmartScore AP

Technology is revolutionizing the way we live, work, and interact with each other. The built environment surrounding us is no exception. From commercial and retail spaces to industrial and manufacturing facilities, all have adopted technologies that not only helped with business operations but also increased productivity, reduced costs, and uncovered new significant value and outcomes previously not realized through real estate assets.

Edge devices, applications, platforms, and various tools are enabling buildings the ability to collect, analyze, trend and share data across historically siloed systems. Owners and operators now have a front-row seat, real-time view into their properties' performance and operations. And industrial facilities are now at the forefront with the fourth industrial revolution upon us. Industry 4.0 is the next phase in the digitization of the manufacturing sector, driven by disruptive trends and advanced technologies including the integration of digital-physical systems, data analytics, Internet of Things (IoT), human-machine interaction, process automation, and robotics.

While a broad and very loosely used term, one of the key technologies that makes digital transformation of the built environment evolution possible is IoT. By connecting physical objects and devices to the digital realm, IoT sensors embedded in machines, equipment, and products in manufacturing and industrial settings enable real-time data collection and communication.



This data can be analyzed to gain valuable insights to:

- improve operational efficiency,
- enable predictive maintenance
- facilitate supply chain optimization.

In the context of smart buildings, IoT devices enable seamless communication and data exchange between various components, including sensors, actuators, and control systems creating enhanced operational efficiency, improved user experiences and intelligent decision-making. The result is transforming buildings from purpose-built reactive physical structures to adaptive and connected ecosystems that can respond to occupancy, improve asset efficiency, and enhance the occupant's comfort, safety, security and experiences through optimization of space, systems and services.

### Improved Building Operations

IoT devices and sensors embedded throughout the building are revolutionizing operations by enabling real-time monitoring and control of critical systems. Sensors deployed throughout the building continuously gather data on energy consumption, temperature, humidity, occupancy, lighting levels, sound levels, vibrations and air quality, among other environmental factors to name a common few. This data is analyzed analytics to optimize various building systems from HVAC, lighting, and other energy-consuming devices, leading to significant energy savings and reduced operational costs. IoT serves as a catalyst for connectivity and integration within smart buildings. By interconnecting devices such as sensors, actuators, lighting systems, HVAC systems, security systems and energy management systems, IoT creates a network of intelligent devices that can collaborate and share data. This connectivity and integration lay the foundation for a cohesive and responsive smart building ecosystem.

IoT facilitates predictive maintenance, ensuring the efficient operation of building systems and minimizing downtime. Sensors and devices can now monitor the performance of equipment and collect data on parameters such as vibration, temperature and energy consumption. By analyzing this data, AI-powered algorithms can predict potential equipment failures, enabling timely maintenance and reducing the risk of unexpected breakdowns. Evolution from preventative to predictive maintenance will help maximize the lifespan of building assets, improve reliability, and lower maintenance costs.

### Space Optimization

IoT technology plays a crucial role in optimizing space utilization within buildings. Occupancy sensors track and analyze how spaces are utilized, providing valuable insights into usage patterns and occupancy density. This data helps facility managers to make informed decisions about space allocation and usage, design efficient layouts, and identify areas for improvement. By optimizing space utilization, smart buildings can reduce wasted space and increase efficiency, creating engaging and dynamic environments.

### Precise Navigation and Tracking

Facilities can be complex to navigate, causing confusion, stress, inefficiencies, and time loss for occupants and visitors. Smart building technologies, such as digital signage and mobile applications, combined with IoT sensors and beacons offer intuitive navigation, wayfinding and asset tracking solutions through location services such as indoor positioning systems (IPS) and real-time location systems (RTLS).

These solutions help locate and track assets and inventory from raw materials, stored products, and completed orders to movable equipment such as forklifts and tool kits. Tracking the movement of assets and employees also allows building owners and operators to analyze efficiencies throughout a facility, optimizing response time and improving operational processes. Product and materials can be tracked at every stage of the process, and aggregate information can be used to monitor the speed at which a product moves through the facility, giving real-time visibility to inventory levels and progress.

### Enhanced Comfort and Productivity

Through tracking of occupancy patterns and the exchange of real-time data across systems, buildings can dynamically adjust heating, cooling and lighting systems to match specific needs creating a more productive workspace. IoT-enabled smart spaces also offer seamless connectivity, enabling occupants to interact with various systems through mobile apps, voice commands or wearables, enhancing convenience and overall user experience. Connected and smart lighting systems have become a key driver of occupant comfort. These systems utilize embedded multi-technology IoT sensors to provide intelligent control over lighting, allowing for automated adjustments based on occupancy and natural light levels, not only enhancing energy efficiency, but also contributing to occupant wellbeing and productivity by providing personalized settings and creating comfortable environments.

### Increased Safety and Security

IoT-powered smart buildings enhance safety and security by integrating sensors and surveillance systems. Connected fire alarm systems, smoke detectors, and security cameras ensure real-time monitoring and immediate response to potential threats. Access control systems utilize IoT connectivity to manage and track building access, enhancing security measures. Additionally, data analytics can identify abnormal patterns or suspicious activities, enabling proactive measures to mitigate risks and ensure the safety of occupants.

In busy manufacturing facilities or industrial warehouses, technology can be used to help prevent accidents by alerting people if they are stepping outside of a safety zone or if there is moving equipment in their line of sight. Visitor movement can be monitored to ensure they remain escorted and within safe zones. And in case of an accident, badges can be fitted with panic buttons to allow people to call immediately for help.

### Driving Sustainability and Energy Efficiency

IoT also is playing a crucial role in reducing environmental impact, and delivering on sustainability initiatives in all facility types. For instance, monitoring sensors provide real-time insights into energy and water consumption of various spaces. Sensors help operators to track usage, detect leaks, identify areas of high consumption, implement saving strategies that allow organizations to reduce their environmental footprints, lower their energy costs, and meet sustainability goals. By monitoring and analyzing energy consumption patterns in real-time, IoT sensors also help enable the optimization of building systems, including HVAC, plumbing and lighting, resulting in energy waste and carbon-emissions reduction, as well as substantial cost savings.

The future of smart buildings lies in the seamless integration of IoT technology and the built environment. With sensors deployed throughout buildings, IoT enables real-time data collection, analysis and automation, transforming the way buildings operate, facilitating data-driven decision-making and improving occupant experiences.

From optimizing energy consumption to enhancing safety and security, IoT-powered smart buildings offer numerous benefits for building owners, occupants and the environment. We are in the midst of this digital revolution, and the potential in the built environment is limitless, paving the way for a more intelligent, sustainable and connected future.



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# Let the Sunshine In: Architectural Design Optimally Harvests Natural Light

By Del Williams

Architects and designers are using daylighting systems for better interior illumination.

When architects, engineers, designers, and building owners consider new construction or operational upgrades, effectively using natural daylight to reduce the need for artificial lighting can improve building aesthetics and function while reducing energy costs.

For architects, letting the sunshine in and optimally harvesting natural light can also contribute to attaining LEED-certification on a building by helping to improve efficiency, lower carbon emissions, save money, and create overall healthier environments.

Although windows let in light, incorporating windows alone is not a very effective means of using natural light in a building. Windows are good for providing outdoor views and ventilation, but not the best source of natural lighting since sunlight primarily travels downward rather than sideways.

While utilizing natural lighting or “daylighting” with skylights is more effective, not all options are equal in terms of the look, feel, or length of the illumination.

Fortunately, for anyone in design-build professions, the industry has advanced significantly from simple skylights to prismatic systems to state-of-the-art daylight harvesting technologies that more effectively illuminate interior spaces than ever before. Today, picking the optimum light harvesting tool has a dramatic

impact on both the ambiance and extent of the interior space lighting and can contribute to a building’s energy savings and LEED-certification.

“Modern daylighting techniques can not only help architectural design projects stand out aesthetically and save energy, but also gain LEED certification when combined with other conservation efforts,” says Kenneth Schlabach, Owner of Campbell Hill, Ill.-based DayStar Systems, a natural daylighting skylight provider for applications in commercial properties, showrooms, offices and industrial facilities throughout North America.

## Daylighting Advances

Good lighting has always been the architectural design professional’s friend and scientific research shows that natural light — sunlight — may be their very best friend in terms of promoting productivity and even commercial sales.

Artificial light is a problem for perceiving color accurately — something that is crucial to fully appreciate architectural design and building interiors. Personnel working in sunlit environments are happier, more productive and are absent less often than those working for long hours under artificial lights. Even commercial functions like retailing are dramatically enhanced when color is perceived accurately. In stores, product colors are more attractive under warm natural lighting that enables the true



colors to shine through.

“For architectural design professionals, daylighting is crucial because it provides the best color perception available. Commercial activity and sales go up because the product looks better and is seen more accurately. Customers’ color perceptions are directly affected by the full light spectrum. In fact, the only way to see ‘true’ color is in full-spectrum light,” says Schlabach.

Traditional skylights essentially act like windows that allow natural daylight to enter vertically. However, simple skylights can allow excess daylight, glare and UV to enter a building’s interior space. Since sunlight enters and exits the skylight directly, some areas tend to receive too much light and others too little, resulting in uneven interior lighting. In addition, even when rudimentary skylights use gaskets and deck seals or flashing, there is usually little to no insulation so excess heat or cold outdoors can thermally transfer inside.

Prismatic skylights use thermoplastic sheets with embossed patterns that diffuse sunlight, so it spreads more evenly through a space and reduces its intensity. The approach, however, does not typically have a systematic means of collecting and amplifying sunlight, which can limit the amount of light gathered, particularly during periods of low light such as early morning, later afternoon, or cloudy days.

Similarly, tubular skylights transfer natural sunlight by using a clear dome over a reflective shaft that ends at the building’s ceiling with a sealed diffuser. However, tubular skylights are less effective at illuminating wider interior spaces. In addition, insulation can be relatively minimal between the roof jacket down to the ceiling, which allows outdoor heat or cold to enter the building.

Modern advances in daylighting skylights are now maximizing the collection of natural light, which can extend daylit hours and enhance lighting on cloudy days much better than previous systems. To aid color perception, productivity, commercial activity and energy use, architectural design professionals are turning to more advanced daylighting skylights like those from DayStar Systems for commercial and industrial applications.

DayStar engineers have developed high-performance skylight systems that capture the sun’s natural light and collect, amplify and diffuse a broad, even pattern of indoor illumination. This is accomplished using a four-part system. First, sunlight is gathered and diffused through an ultra-clear outer dome and inner collimation lens. The dome is supported by insulated roof curbs of galvalume steel or aluminum continuously welded for watertight seams. Then a light shaft made of insulated panels with highly reflective interior surfaces amplify light as it is captured. The extra insulation provides higher thermal values, minimizing heat loss and heat gain. And finally, an attractive ceiling lens, engineered to diffuse highly concentrated light into a broad lighting pattern, is installed on the interior ceiling.

The company’s light-harvesting method extends daylit hours every day of the year by collecting and dispersing more natural light during early mornings and late afternoons than any other daylighting system. With the reflective shaft, even on a cloudy day, the high-performance skylights collect more diffused light and distribute it more evenly with just the dome system. The result is superior illumination with little to no need for electric lights.

The daylighting skylights are easy to install, and come with detailed instructions and all the materials required, so they can be incorporated even at later stages of a building project.

As architects and design professionals seek to create more eco-friendly yet dramatic commercial spaces in which to work, shop and live, modern daylighting skylights will become an increasingly important tool that they can rely on. Harnessing renewable and free natural light not only makes the building’s interior space more inviting, but also cuts the cost of generating artificial lighting and reduces collateral expenses as well.

For more information on natural daylighting systems, visit [www.daystarskylightsystem.com](http://www.daystarskylightsystem.com), email [info@daystar1.com](mailto:info@daystar1.com) or call (618) 426-1868.

*Del Williams is a technical writer based in Torrance, Calif.*



Design-build professionals are using superior daylight harvesting methods to improve interior illumination and aesthetics while conserving energy.

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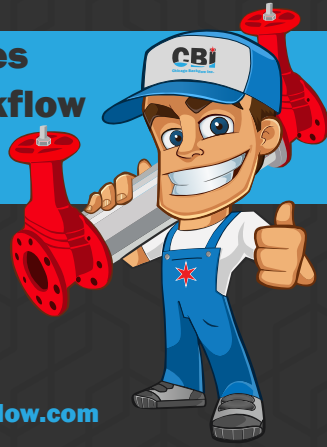
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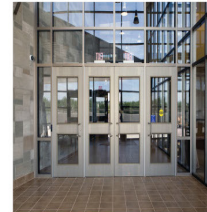
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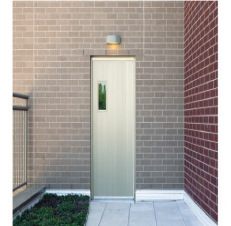
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The new line of outdoor MOV AC panel surge protectors was designed to especially meet the needs of the telecommunications industry, industrial facilities, and IT and data centers.


Transtector's new AC panel surge protectors include models for all common AC services. These include 120 Vac single-phase, 120/240 Vac split-phase, 208/120 Vac three-phase wye, 277/480 Vac three-phase wye, 240 Vac three-phase delta and 480 Vac three-phase wye.

They are available with 100 kA, 200 kA or 300 kA surge capacity per phase.

The new outdoor devices are dual-listed to meet two sets of Underwriter Laboratories' safety and performance standards. They satisfy UL 1449 requirements as Type 2 SPDs, and UL 1283 certification as EMI filters.

The new AC panel surge protectors are rugged enough for outdoor use. They are housed in watertight, corrosion-proof NEMA 4X enclosures that mount to a wall. Their operating temperature range is -40 degrees to +167 degrees Fahrenheit.

"Our new line of outdoor AC panel SPDs with MOV technology do double duty in protecting AC power networks and local AC equipment from harmful transient surges as well as EMI interference," said Transtector Product Line Manager Dan Rebeck.

Transtector's new outdoor AC panel surge protectors with high-capacity MOV technology are in stock and available for same-day shipment. 

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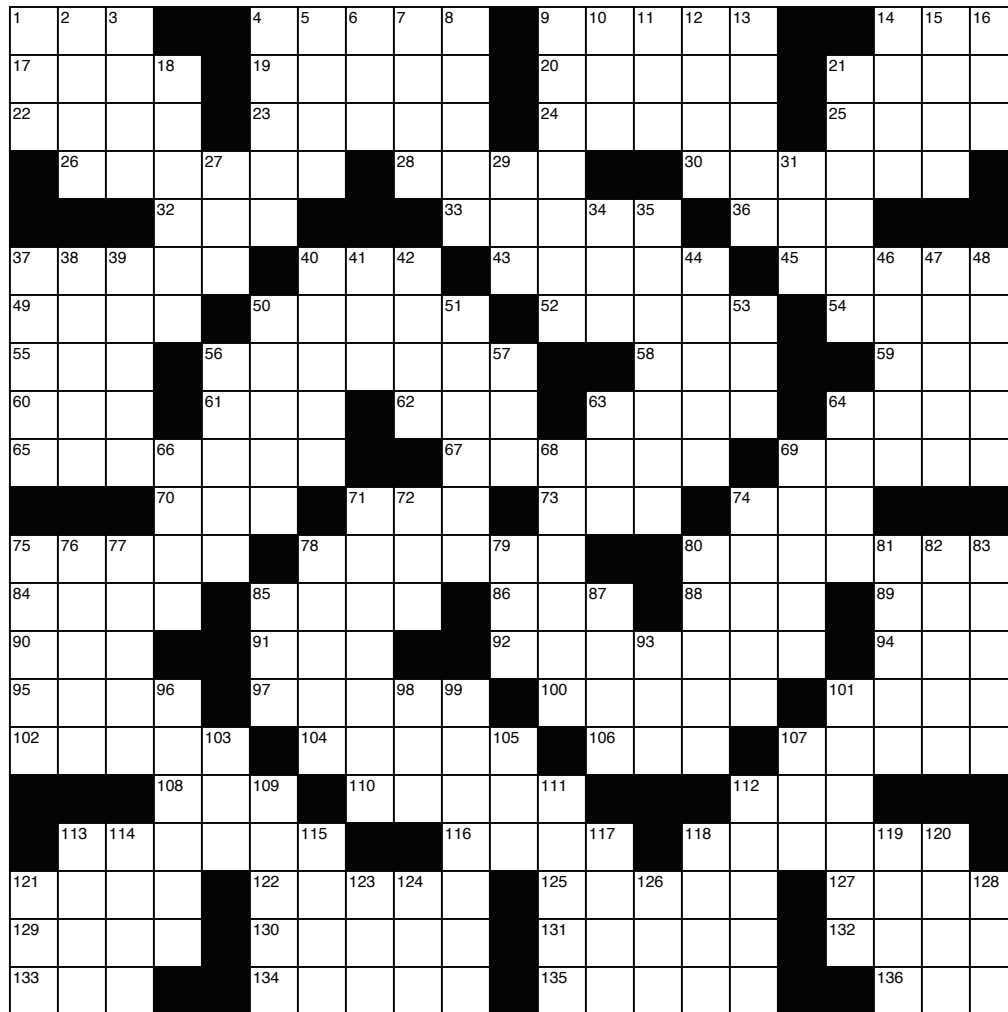


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# Facility Cooling Season



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**ACROSS**

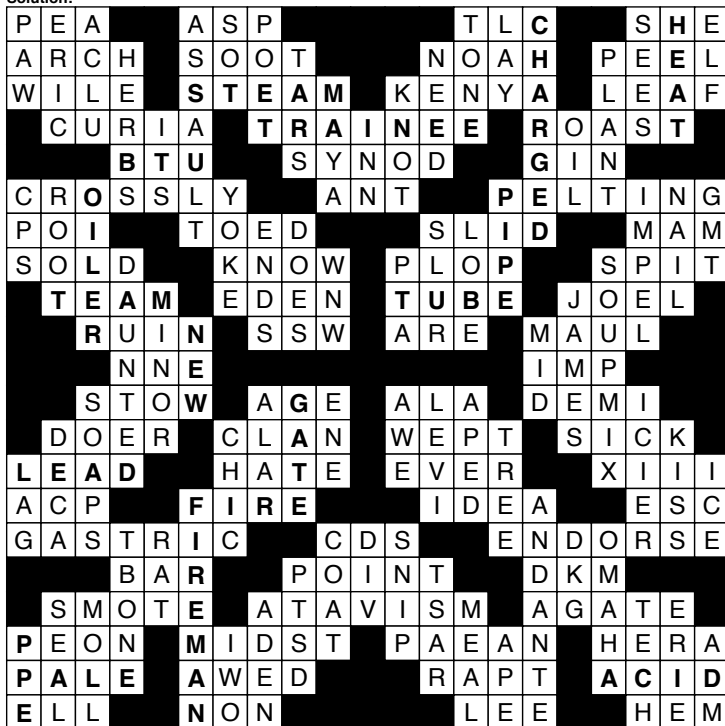
- 1 Globe
- 4 Displace
- 9 Stadium
- 14 Brassiere
- 17 Gas
- 19 Large stringed instrument
- 20 Household cleaner brand
- 21 Seabird
- 22 What a clock tells
- 23 Yield
- 24 Birds with webbed feet
- 25 Attorney (abbr.)
- 26 Jellied gasoline
- 28 "as you \_\_\_"
- 30 Eras
- 32 Bard's before
- 33 Jewish religious leader
- 36 Derby
- 37 Chaplain
- 40 Make lace
- 43 Lop
- 45 Towhee
- 49 Ventilates
- 50 Japanese bed
- 52 Giant in 'Princess
- Bride'
- 54 Fizz drink
- 55 Pounds per square inch
- 56 Frozen Russian area
- 58 Vase
- 59 Profit
- 60 Pixy
- 61 Downwind
- 62 Thai
- 63 Did well
- 64 Ripped up
- 65 Sells to customers
- 67 Completed
- 69 Face disguise
- 70 Limited (abbr.)
- 71 Friday (abbr.)
- 73 Doctoral degree
- 74 Bother
- 75 **Questions**
- 78 Dark hair color
- 80 Brave
- 84 Fake butter
- 85 Canal
- 86 Yang's partner
- 88 Bullfight cheer
- 89 Water closet
- 90 Long-term memory
- 91 Oodles
- 92 Produces emotion
- 94 Note of debt
- 95 Press
- 97 Secure
- 100 Side note
- 101 Union of Soviet Socialist Republics
- 102 Desert pond
- 104 Terminal
- 106 Yea
- 107 Painter Richard
- 108 Unworn
- 110 Ranker
- 112 Truck
- 113 Author of "Faust"
- 116 N.T. prophet
- 118 **Coordinate**
- 121 **Fine spray**
- 122 Water retention
- 125 French author
- 127 Eroded
- 129 Efficiently
- 130 Inched forward
- 131 **Breeze**
- 132 Made thread
- 133 Constellation
- 134 French city
- 135 Gossiper
- 136 Stitch

**DOWN**

- 1 Often poetically
- 2 Spoil
- 3 Torah table
- 4 **Ascend**
- 5 What the pilot uses
- 6 Peaked
- 7 **Flux**
- 8 **Bell riser**
- 9 School subject
- 10 Grain
- 11 Vane direction
- 12 Snoot
- 13 First letter in Hebrew alphabet
- 14 All
- 15 Decays
- 16 One of these
- 18 Outcast
- 21 Relating to milk
- 27 Be
- 29 Strike sharply
- 31 Clod
- 34 Hotdog holder
- 35 **Brought about**
- 37 Book material
- 38 Passageway
- 39 **Stray**
- 40 **Hoses**
- 41 Dined
- 42 Civil wrong
- 44 Goofed
- 46 Taboos
- 47 Record keeper
- 48 Abhors
- 50 Catch in play
- 51 B vitamin
- 53 Terminate
- 56 Narrow openings
- 57 Cause of sickness
- 63 Tree
- 64 Cab
- 66 Dog food brand
- 68 Type of American Express card
- 69 Trouble
- 71 Fried batter
- 72 Regret
- 74 **Internal flap**
- 75 Crippling disease
- 76 Fanatical
- 77 Short notes
- 78 Wide
- 79 Peeper
- 80 Nulls
- 81 List of highly desired guests
- 82 Lasso
- 83 What tourists take
- 85 Wing
- 87 Meddling
- 93 Draw
- 96 Very old age
- 98 Certified public accountant
- 99 Oven mitts (2 wds.)
- 101 "\_\_\_ and World Report"
- 103 Place
- 105 Drink
- 107 Serving of corn
- 109 Round rotating object
- 111 Reddish
- 112 Scene
- 113 Tease
- 114 National capital
- 115 **Swirl**
- 117 Decoy
- 118 Nuts
- 119 Policemen
- 120 Factual
- 121 Bad (prefix)
- 123 Self
- 124 Males
- 126 Staff
- 128 Compass point

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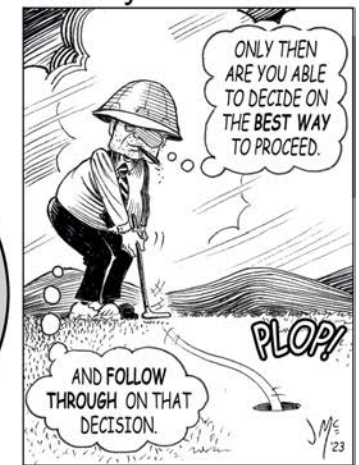
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by Jim McGreal



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