

# CHIEF ENGINEER™

JANUARY 2026



**Rising Through the Ranks at 111 N. Wabash**

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**A Case Study in Relationships**

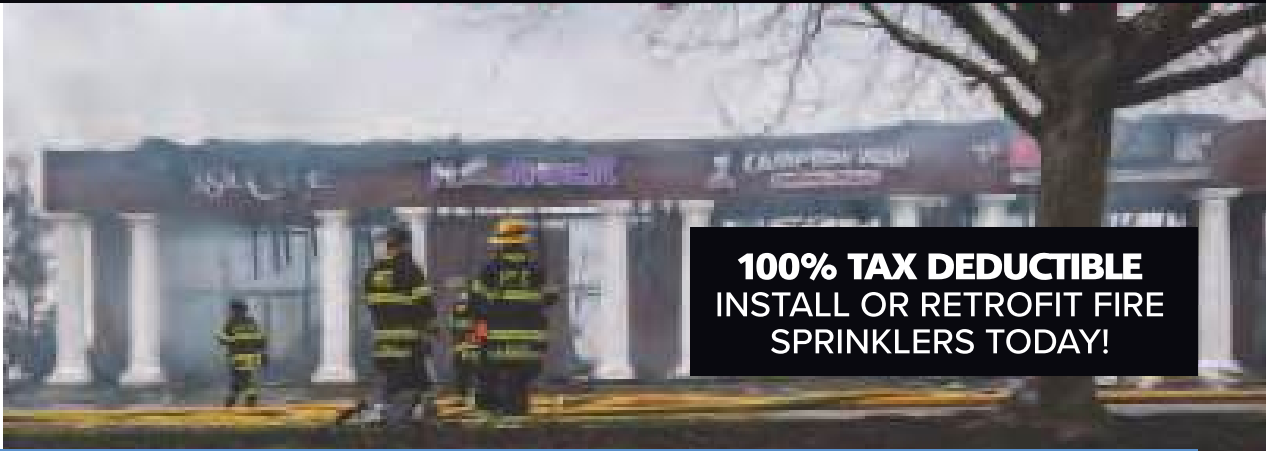
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**Making People Comfortable: Atomic Mechanical Services**

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# 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.

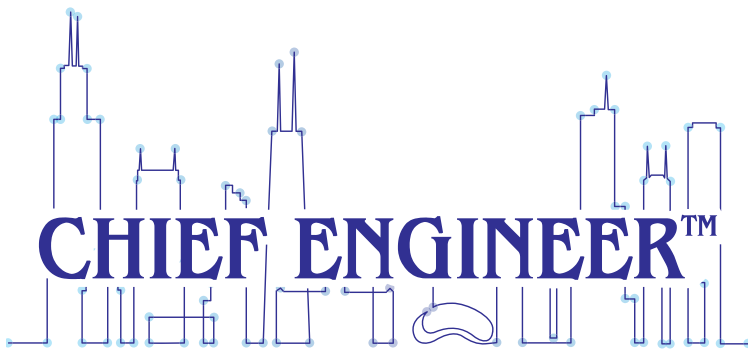
For more information on how these tax incentives might impact the business of your contractors, we would recommend that they contact their tax professionals, as situations differ based on the facts and circumstances for each business. As a general rule, we would not recommend that the Local provide tax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



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VOLUME 91 • Number 1

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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at 111 N. Wabash**

We shadow Engineering Trainee Sarah Alaniz through her routine at 111 N. Wabash to learn what it's like to be on the learning curve in the industry today.

**26 A Case Study in Relationships**

Looking at an outside outfit's success in development through its relationships.

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Automatic Mechanical Services**

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Dear Members,

As we enter 2026, let me be among the first to wish you a happy New Year. I hope you all had a great holiday season with your families and loved ones, and are looking forward to this new year with a renewed sense of purpose.

Two years ago, I was sworn in as your President of the Chief Engineers Association of Chicagoland (CEAC). The time has gone by quickly, and it's almost hard to believe that it's time to hand over the reins to our incoming President, Larry McMahon. It's been an honor and a privilege to lead this fine organization these past two years, and I want to thank the Board and our entire membership for its support. I look forward to this year's Inaugural Gala taking place on Saturday, Jan. 24, at the Local 399 Union Hall, and hope to see you there.

The CEAC has been a great organization for our profession, and it's always been rewarding to see so many of the membership show up to the monthly meetings and our other special events. Our Vendor Fair, a very important event for our Associate Members in particular, has become so in demand that we decided to make it an annual occasion. This year, we're looking forward to Wednesday, April 22, from 3:00-7:00pm at the Morgan Arts Complex (3622 S. Morgan St., Chicago) to see all of our Associate Member organizations and what they're offering that's new and exciting for our industry. Both attendee and vendor booth registration is now open. If you're a vendor and are looking to get a great location for your booth, don't wait — the hall tends to fill up quickly.

The cold weather arrived early this winter, and while I'm certain we all had our boilers prepped and ready to go, it's not going to be too long before we start looking at getting our cooling systems in order for the warmer weather. Before the winter subsides, let's make some family memories at this year's SkateFest, coming up on Saturday, Feb. 21 at 1:30pm, at the Morgan Park Sports Center. The rink and gymnastics hall will be open, as usual, and there will be plenty of food and fun for everyone.

Thank you again, everyone, for making the CEAC such an excellent organization to lead, and to be a part of. I look forward to us growing together in the year ahead.

Sincerely,

*Doug Kruczek*  
Doug Kruczek



## ASHRAE Illinois Chapter Scholarship Program Applications Due

Applications for the ASHRAE Illinois Chapter Scholarship Program currently are being sought through the annual Jan. 31 deadline. The program provides financial assistance to qualifying students who are interested in STEM/engineering paths with an eye to pursuing a career in the HVAC&R industry.

- Resident of Illinois
- High school senior, undergraduate, or graduate student
- Seeking a professional certification, associate, bachelor's or graduate degree
- Studying for a degree in heating engineering, refrigerating and air conditioning tech, or STEM-related fields
- Attending or planning to attend school in Illinois
- Plan to pursue a career in heating, ventilating, refrigeration and air conditioning
- Proven academic achievement (3.0 GPA or higher)

To download the application in pdf form, visit [illinoisashrae.org/Scholarship](http://illinoisashrae.org/Scholarship). Completed applications should be submitted to [scholarships@illinoisashrae.org](mailto:scholarships@illinoisashrae.org) no later than Jan. 31, 2026.



## Innovation, Resilience and Healthy Buildings to Take Center Stage at 2026 ASHRAE Winter Conference

The full technical program is now available for the 2026 ASHRAE Winter Conference, to be held Jan. 31-Feb. 4, 2026, in Las Vegas, Nev., with the AHR Expo running concurrently Feb. 2-4 at the Las Vegas Convention Center.

Attendees can now explore the complete schedule via the ASHRAE 365 app or online and begin planning their custom conference agenda, including technical sessions, committee meetings, industry tours, award recognitions and networking events.

This year's conference will present 100+ technical sessions distributed across nine topical tracks, offering Professional Development Hours (PDHs) for participants. The tracks reflect the Society's focus on integrating new technologies and strategies, such as AI, energy resiliency and decarbonization, while advancing the fundamentals of HVAC&R design and operation.


Key sessions include:

- AI in Action: A Real-World Application of AI for Campus Energy Optimization (Seminar)
- Development of a Building Services Cybersecurity Profile (Workshop)
- Next-Generation Refrigeration Systems for Supermarkets: Performance, Safety Requirements and Implementation Challenges (Panel)
- Human-Centered IEQ: Advancing Health and Performance in Modern Spaces (Seminar)

The ASHRAE Learning Institute (ALI) will also offer 21 courses, all approved for continuing education credits toward maintaining P.E. licensure.


Four additional new courses are being offered:

- *Laboratory Controls - Devices and Strategies for Proper Airflow*
- *Designing Residential Ventilation Systems to Meet ASHRAE Standard 62.2*
- *Demystifying Dehumidification: Designing Efficient and Effective HVAC Moisture Removal Systems*
- *Decarbonization Tactics: Making Buildings Grid-Interactive*

Several courses provide exam task content for ASHRAE Certifications. 

For the full technical program, registration and additional information, visit [ashrae.org/2026Winter](http://ashrae.org/2026Winter).






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**The WWETT Show**  
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**Indiana Convention Center, Ind.**  
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The WWETT Show is the premier gathering for wastewater and environmental service professionals, offering unparalleled access to cutting-edge technology, industry education, and powerful business connections. As the industry's leading platform, The WWETT Show delivers hands-on experiences, expert-led insights, and the most comprehensive marketplace for solutions.

The WWETT Show Expo Hall is the ultimate business hub for the wastewater industry, offering more than 300,000 square feet of exhibit space designed to connect industry professionals and innovators. Whether you're an attendee seeking the latest products and solutions, or an exhibitor looking to showcase your offerings to a highly engaged audience, the Expo Hall provides an unparalleled marketplace to drive business and build relationships.

The conference program covers the broader wastewater industry, offering expert insights on regulations, innovations and best practices across diverse sectors. Attendees will learn from more than 100 renowned speakers who deliver actionable knowledge through engaging presentations and workshops addressing key industry topics and trends. Attendees are encouraged to register for a Full Education Package to gain access to all conference programming. (Tour/workshops require an additional fee.) Opportunities include:

**Building Sewer and Drain Inspection (BSDI™) Certification Course**

Offered free — a \$225 value — to WWETT conference attendees, NASSCO's in-person, 3-hour Building Sewer and Drain Inspection (BSDI™) Certification Course is designed to assist plumbers, sewer and drain contractors, and inspectors in the proper inspection and assessment of private property building sewer and drains. Heavily based on NASSCO's PACP™ standards, BSDI teaches participants to use unique codes to identify conditions within a pipe for assessment consistency. Following successful completion of an exam, students will receive BSDI-certification, CEU/PDH credits, and will be listed on NASSCO's searchable website as a Certified Individual.


**Operation and Maintenance of Onsite Wastewater Treatment Septic Tanks**

During this presentation, attendees will first go over the different types of tanks used in sewage treatment systems, along with their designs and functions. This will include septic, pump, flow equalization and gravity grease interceptor tanks. Presenters will go through the maintenance process step by step, including tank and operational condition assessment, and will evaluate how to inspect the tank to assess its structural and operational condition. Attendees will also examine how to properly inspect and evaluate components such as baffles, pumps, and filters, and also how to measure sludge and scum levels in the tank. Proper recording of O&M data and results also will be discussed. Whether attendees are new to the industry or seasoned veterans, this presentation will provide valuable information, tips and guidance on O&M of a sewage treatment system, which will enhance their ability to maximize efficiency and resilience of the systems they service.

**Keys to Managing Low-Pressure Pipe and Drip Distribution in Onsite Wastewater Treatment Systems**

The main objective when using low-pressure distribution is to evenly distribute wastewater over the entire length of the trenches. To accomplish uniform distribution, laterals composed of small diameter pipes with small diameter orifices are used. LPD is typically installed in a trench and the pipe is supported by stone or other material. It is critical for the operator to have access to original LPD designs and as-built drawings, as valve and manifold arrangements can vary widely. A drip distribution system delivers small doses of treated effluent to the soil through a system of tubing with flow regulating emitters. The soil accepts the effluent, providing final treatment through removal of contaminants prior to dispersal to the receiving environment. This session will provide O&M service providers with both an overview of the technology applications and useful techniques to evaluate performance and troubleshoot the systems when problems arise.

**Common Problems With Wastewater Control Panels**

This presentation is intended to create a working knowledge of how control panels work and how to safely and correctly identify problems in the field. Discussions will include electrical terms and what they mean, explanation of the physical and electrical differences in floats and how they work, and control panel components and how they relate and work together. Focus will touch on multi meters, the proper ways to troubleshoot a float, and tricks to point you in the right direction when troubleshooting a panel. 

*Many more worthwhile sessions are scheduled. For more information or to register, visit [www.wwettshow.com](http://www.wwettshow.com).*



**Illinois PHCC EXPO North  
Friday, March 20, 2026  
Drury Lane Conference Center  
100 Drury Lane, Oakbrook Terrace**

The Illinois PHCC has scheduled Friday, March 20, 2026, as the date for its annual trade show. The EXPO will once again be held at the Drury Lane Conference Center in Oakbrook Terrace, Ill. The American Society of Plumbing Engineers (ASPE) once again will be co-locating their event with the Illinois PHCC, enabling engineers to attend the product show as well as ASPE educational programs.

The March 20 date will be a day for educational opportunities and attending the EXPO. A 4-hour continuing education program will be offered on Friday morning. This will be held in the theater and will allow up to 800 people to obtain their CEU credit. Exhibitors and attendees are both invited to the after-EXPO party where there will be prizes and free food. 📺 📺

For more information or to register, visit [www.ilphcc.com/expo](http://www.ilphcc.com/expo).





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J.C. Anderson recently completed the Chicago headquarters and studio for Good Karma Brands and ESPN Chicago at 141 W. Jackson.

## **J.C. Anderson Completes New Chicago Headquarters and Studio for Good Karma Brands & ESPN Chicago at 141 W. Jackson**


J.C. Anderson recently announced its completion on construction of the new Chicago headquarters and broadcast studio for Good Karma Brands, home to ESPN Chicago and the flagship radio broadcasts of the Chicago Bears and Chicago White Sox. Located at 141 W. Jackson Blvd., the project began on Sept. 1, 2025, and was scheduled for completion on Dec. 19, 2025.

Managed by R2, with brokerage partners Andrew Marty of Madison Rose representing the building, and Pete Delneky of CBRE representing the tenant, the project brought together a highly collaborative team including architect Geniant, R2’s project management team, and J.C. Anderson as general contractor.

The buildout includes a comprehensive studio environment designed specifically to support ESPN Chicago’s broadcasting and production needs. The space features one main broadcasting studio, a dedicated play-by-play room, one production room, and two control rooms.

In addition to the technical spaces, J.C. Anderson constructed a modern Chicago office for Good Karma Brands. The design includes an open-ceiling concept, hand-painted murals in the boardroom, custom felt walls throughout the corridors, and custom graphic walls in shared areas such as the breakroom and entry lounge.

The construction team for J.C. Anderson was led by Project Executive Brian Vogt, Project Manager Matt Schumacher and Superintendent Jose Verduzco. 🏗️🏠



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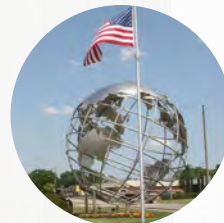
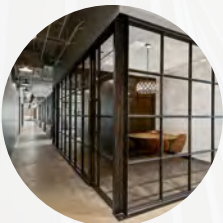
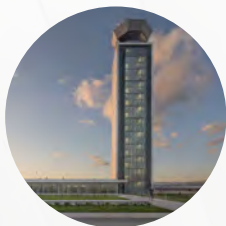
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## **COPING WITH STEAM TRAPS**

Steam traps are automatic valves that release condensed steam (condensate) from a steam space while preventing the loss of live steam. They also remove non-condensable gases from the steam space. Steam traps are designed to maintain steam energy efficiency for performing specific tasks such as heating a building, or maintaining heat for process. Once steam has transferred heat through a process and becomes hot water, it is removed by the trap from the steam side as condensate and either returned to the boiler via condensate return lines or discharged to the atmosphere, which is a wasteful practice (Gorelik and Bandes 2001).

Steam traps are commonly classified by the physical process causing them to open and close. The three major categories of steam traps are 1) mechanical, 2) thermostatic, and 3) thermodynamic. In addition, some steam traps combine characteristics of more than one of these basic categories.

When steam traps cause a backup of condensate in a steam main, the condensate is carried along with the steam. It lowers steam quality and increases the potential for water hammer. Not only will energy be wasted, equipment can be destroyed. Water hammer occurs as slugs of water are picked up at high speeds in a poorly designed steam main, in pipe coils, or where there is a lift after a steam trap. In some systems, the flow may be at 120 feet per second, which is about 82 mph. As the slug of condensate is carried along the steam line, it reaches an obstruction, such as a bend or a valve, where it is suddenly stopped. The effect of this impact can be catastrophic. It is important to note that the damaging effect of water hammer is due to steam velocity, not steam pressure. It can be as damaging in low-pressure systems as it can in high. This can actually produce a safety hazard, as the force of water hammer can blow out a valve or a strainer. Condensate in a steam system can be very destructive. It can cause valves to become wiredrawn — worn or ground — and unable to hold temperatures as required. Little beads of water in a steam line eventually can cut any small orifices the steam normally passes through.

Wiredrawing will eventually cut enough of the metal in a valve seat that it prevents adequate closure, producing leakage in the system (Gorelik and Bandes 2001).

### **Maintenance of Steam Traps**

Considering that many sites have hundreds if not thousands of traps, and that one malfunctioning steam trap can cost thousands of dollars in wasted steam per year, steam trap maintenance should receive constant and dedicated effort.

Excluding design problems, two of the most common causes of trap failure are oversizing and dirt:

- Oversizing causes traps to work too hard. In some

cases, this can result in blowing of live steam. As an example, an inverted bucket trap can lose its prime due to an abrupt change in pressure. This will cause the bucket to sink, forcing the valve open.

- Dirt is always being created in a steam system. Excessive build-up can cause plugging or prevent a valve from closing. Dirt is generally produced from pipe scale or from over-treating of chemicals in a boiler.

### **Steam Trap Water-Use Best Practices**

The predominant impact steam traps have on water use relates to proper function. A steam trap that is failed open coupled to distribution system with a leaky or non-existent condensate return will be losing water, via condensed steam, at a significant rate. Whether failed open or closed, an improperly functioning steam trap impacts the entire system by introducing inefficiency. Any inefficiency results in a less-than-optimal operation leading to increased resource use — water is one of those resources.

Description	Comments	Maintenance Frequency			
		Daily	Weekly	Monthly	Annually
Test steam traps	Daily/weekly test recommended for high-pressure traps (250 psig or more)	X			
Test steam traps	Weekly/monthly test recommended for high-pressure traps (30-250 psig or more)		X		
Test steam traps	Monthly/annually test recommended for low-pressure traps			X	
Repair/Replace steam traps	When testing shows problems. Typically, traps should be replaced every 3-4 years			X	
Replace steam traps	When replacing, take the time to make sure traps are sized properly				X

*Steam traps checklist*

### **Relevant Operational/Energy Efficiency Measures**

There are many operational/energy efficiency measures that could be presented for proper steam trap operation and control. The following section focuses on the most prevalent O&M recommendations having the greatest energy impacts at Federal facilities. These recommendations are also some of the most easily implemented for boiler operators and O&M contractors.

### **Steam Trap Measure: Cost Evaluation of Failed Steam Trap**

The table atop the following page can be used to approximate the energy loss from a failed-open steam trap (DOE 2006).

Trap Orifice Diameter (in.)	Steam Loss (lb/hr)			
	Steam Pressure (psig)			
	15	100	150	300
1/32	0.85	3.3	4.8	–
1/16	3.40	13.2	18.9	36.2
1/8	13.7	52.8	75.8	145
3/16	30.7	119	170	326
1/4	54.7	211	303	579
3/8	123	475	682	1,303

Steam trap discharge rate

**Case Studies**

*1986 Event at a Major Research Government Facility (DOE 2001b):*

On Oct. 10, 1986, a condensate-induced water hammer at a major research government facility injured four steamfitters — two of them fatally. One of the steamfitters attempted to activate an 8-inch steam line located in a manhole. He noticed that there was no steam in either the steam line or the steam trap assembly and concluded that the steam trap had failed. Steam traps are devices designed to automatically remove condensate (liquid) from steam piping while the steam system is operating in a steady state. Without shutting off the steam supply, he and another steamfitter replaced the trap and left.

Later the first steamfitter, his supervisor, and two other steamfitters returned and found the line held a large amount of condensate. They cracked open a gate valve to drain the condensate into an 8-inch main, cracking the valve open enough to allow water to pass. But this was too far open to control the sudden movement of steam into the main after all the condensate had been removed. A series of powerful water hammer surges caused the gaskets on two blind flanges in the manhole to fail, releasing hot condensate and steam into the manhole. All four steamfitters suffered external burns and steam inhalation. Two of them died as a result.

A Type A Accident Investigation Board determined that the probable cause of the event was a lack of procedures and training, resulting in operational error. Operators had used an in-line gate valve to remove condensate from a steam line under pressure instead of drains installed for that purpose.

The board also cited several management problems. There had been no Operational Readiness Review prior to system activation. Laboratory personnel had not witnessed all the hydrostatic and pressure testing, nor had all test results been submitted, as required by the contract. Documentation for

design changes was inadequate.

*1991 Event at a Georgia Hospital (DOE 2001c):*

In June 1991, a valve gasket blew out in a steam system at a Georgia hospital. Operators isolated that section of the line and replaced the gasket. The section was closed for 2 weeks, allowing condensate to accumulate in the line. After the repair was completed, an operator opened the steam valve at the upstream end of the section. He drove to the other end and started to open the downstream steam valve. He did not open the blow-off valve to remove condensate before he opened the steam valve. Water hammer ruptured the valve before it was 20-percent open, releasing steam and condensate and killing the operator.

Investigators determined that about 1,900 pounds of water had accumulated at the low point in the line adjacent to the repaired valve, where a steam trap had been disconnected. Because the line was cold, the incoming steam condensed quickly, lowering the system pressure and accelerating the steam flow into the section. This swept the accumulated water toward the downstream valve and may have produced a relatively small steam-propelled water slug impact before the operator arrived. About 600 pounds of steam condensed in the cold section of the pipe before equilibrium was reached.


When the downstream valve was opened, the steam on the downstream side rapidly condensed into water on the upstream side. This flow picked up a 75 cubic foot slug of water about 400 feet downstream of the valve. The slug sealed off a steam pocket and accelerated until it hit the valve, causing it to rupture.

Investigators concluded that the accident could have been prevented if the operator had allowed the pipe to warm up first and if he had used the blow-off valve to remove condensate before opening the downstream valve.

**Maintenance of Steam Traps**

A steam trap assessment of three VA hospitals located in Providence, R.I., Brockton, Mass., and West Roxbury, Mass., was conducted with help of FEMP’s SAVEnergy Program. The facilities are served by 15-, 40- and 80-psig steam lines. The Providence system alone includes approximately 1,100 steam traps.

The assessment targeted steam trap performance and the value of steam losses from malfunctioning traps. The malfunctioning traps were designated for either repair or replacement.

Included in this assessment was a training program on steam trap testing. The cost of the initial steam trap audit was \$25,000 for the three facilities. Estimated energy savings totaled \$104,000. The cost of repair and replacement traps was about \$10,000. Thus, the cost savings of \$104,000 would pay for the implementation cost of \$35,000 in about 4 months. 



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# Rising Through the Ranks at 111 N. Wabash

How Engineering Trainee Sarah Alaniz Is Building a Career —  
One System, One Question and One Lesson at a Time

By Michael A. Badame



Engineering Trainee Sarah Alaniz outside of 111 N. Wabash Ave.



*Alaniz learns by facing the same challenges that her more experienced colleagues face, from equipment like the building's boilers like the one here, to wide-ranging tenant demands, and changing expectations for the building's energy performance.*

On a typical weekday morning in downtown Chicago, before most office lights are fully on and before the Loop fills with commuters, the mechanical spaces at 111 N. Wabash Avenue are already alive. Pumps cycle into their morning rhythm, air handlers begin ramping up to meet tenant demand, and the quiet routines that keep a historic high-rise operating begin again.

Among the engineers walking rounds is Sarah Alaniz, an up-and-coming engineering trainee whose career is just beginning — but whose mindset already reflects the future of the profession.

At a time when the industry is facing retirements, labor shortages and rapidly evolving building technology, Alaniz represents something critically important: the next generation of operating engineers who are learning the craft the right way — on the floor, in the plant, and under experienced mentorship.

For the Chief Engineers Association of Chicagoland, stories like hers matter. They illustrate not just individual ambition, but the sustainability of the trade itself.

### **A Landmark Building With Modern Demands**

Located in the heart of the Loop, 111 N. Wabash Avenue is a historic commercial building originally constructed in the early

20th century. Like many legacy high-rises in Chicago, it blends classic architecture with modern mechanical infrastructure. The building spans several hundred thousand square feet and supports a diverse mix of office tenants, all of whom expect reliable comfort regardless of season.

Running a building of this vintage presents unique challenges. Older construction methods, evolving tenant loads and updated codes all converge in the mechanical room. Systems that were designed for a different era must now perform under modern expectations for comfort, efficiency and reliability.

For a trainee like Alaniz, that complexity makes the building an ideal classroom.

"This isn't a place where you just flip switches," Alaniz said. "Every system has a history. You have to understand why it was designed a certain way before you can operate it properly."

That philosophy mirrors the values long emphasized by seasoned chief engineers across Chicago: Respect the equipment, understand the sequence, and never assume that yesterday's solution fits today's load.



Troubleshooting a refrigeration system — part of the hands-on routine helping to make Sarah Alaniz a master of her trade.

### Learning the Trade from the Ground Up

Alaniz did not enter the field expecting instant mastery. Like many trainees entering building operations today, she understood early on that competence would come through repetition, observation, and asking questions — sometimes a lot of them.

“One of the biggest things I’ve learned is that you don’t rush this job,” she explained. “You watch, you listen, and you learn how the building reacts.”

At 111 N. Wabash, her training includes daily rounds, preventive maintenance tasks, log readings, and hands-on exposure to HVAC systems, electrical distribution, life safety equipment, and building automation system (BAS) interfaces. She works alongside senior engineers who

have spent decades operating downtown buildings and understand the seasonal rhythms of Chicago — from subzero winters to peak summer cooling loads.

For chief engineers reading this, the value is clear: Trainees like Alaniz are absorbing institutional knowledge that can’t be found in manuals or training videos alone.

### Mentorship That Still Matters

One of the defining elements of Alaniz’s development has been mentorship. Rob Nehf, 111 N. Wabash Chief Operating Engineer, has played a key role in shaping how she approaches the job.

“You can teach procedures,” Nehf said, “but you really have to teach judgment. That only comes from experience, and the only way to pass it on is to spend time.”

Nehf emphasized that mentoring a trainee is not about shortcuts or surface-level instruction. It's about explaining why a valve is throttled a certain way, why trend data matters more than a single snapshot, and why good engineers are always thinking two steps ahead of the system.

"She asks the right questions," he added. "And that's half the battle."

This relationship reflects a broader challenge — and opportunity — within the industry. As experienced engineers retire, the responsibility to transfer knowledge becomes urgent. Alaniz's progress demonstrates what happens when that responsibility is taken seriously.

### **Technical Exposure in a Real-World Environment**

At 111 N. Wabash, Alaniz is not sheltered from complexity. She is exposed to the same systems and issues that challenge veteran engineers: fluctuating tenant demands, seasonal changeovers, aging equipment, and increasing expectations around energy performance.

She has learned to read BAS trends, understand alarm logic, and recognize early warning signs before they become service calls.

"You start to notice patterns," she said. "Temperatures drifting, valves not reacting the way they should — it all tells a story if you're paying attention."

For operating engineers, this type of exposure is essential. Trainees who learn to interpret data early are better prepared to manage modern buildings where analytics, automation and efficiency targets are becoming standard.

### **Why This Matters to the Industry**

The Chief Engineers Association of Chicagoland has long emphasized education, mentorship and professional development. Alaniz's story aligns directly with that mission.

She represents a new generation entering an industry that is no longer just mechanical — it is technical, data-driven, and increasingly interdisciplinary. Today's operating engineers must understand not only how equipment runs, but how it communicates, how it consumes energy, and how it supports broader sustainability goals.

"There's a lot more technology involved now," Alaniz said. "You still need to know the basics, but you also have to understand controls, sensors, and how everything ties together."

That awareness is critical. Buildings are no longer static systems — they are dynamic environments that demand continuous learning.

### **Challenges Facing New Trainees**

Despite her enthusiasm, Alaniz is realistic about the challenges ahead. The learning curve is steep, and expectations are high.

"There are days where you feel overwhelmed," she admitted. "But those are usually the days you learn the most."

She credits her team for creating an environment where questions are encouraged and mistakes are treated as learning opportunities rather than failures.

For chief engineers managing younger staff, this approach is essential. Creating space for learning while maintaining operational excellence is one of the most difficult — and important — balances in the profession.

### **Building Confidence Through Responsibility**

As her training progresses, Alaniz is being given greater responsibility. She participates in troubleshooting, assists with contractor coordination, and takes part in seasonal planning discussions.

Being included in those conversations matters.

"When you hear how decisions are made," she said, "you start thinking differently. You're not just reacting — you're planning."

That shift from task execution to systems thinking is what separates technicians from engineers. It's also what ensures the next generation is prepared to step into leadership roles.

### **The Bigger Picture: Sustaining the Trade**

For the Chief Engineers Association of Chicagoland, stories like this are more than profiles — they are indicators of the trade's future.

The industry cannot rely solely on experienced engineers carrying the load indefinitely. It must invest in trainees who are curious, disciplined and committed to learning the craft.

Alaniz's development shows what happens when that investment is made.



Engineering Trainee Sarah Alaniz and Chief Engineer Rob Nehf staying on top of things at 111 N. Wabash Ave.



Alaniz's routine involves working alongside engineers with a deep understanding of the seasonal rhythms of Chicago, including ensuring that the building's cooling towers can handle the peak summer cooling loads.

"She's not just learning how to run equipment," Nehf said. "She's learning how to think like an engineer."

That distinction matters more than ever.

### **Looking Ahead**

When asked where she sees herself in the future, Alaniz doesn't rush the answer.

"I want to be really good at this," she said. "I want to understand buildings inside and out."


It's a grounded response — one that seasoned chief engineers will recognize immediately. The best operators are rarely in a hurry. They build careers the same way they run buildings: deliberately, carefully, and with respect for the systems they oversee.

At 111 N. Wabash, that process is already underway.

### **Why Chief Engineers Should Pay Attention**

For chiefs reading this, the takeaway is clear. The future of building operations depends on identifying, training and mentoring talent like Sarah Alaniz.

It means investing time, sharing knowledge, and creating pathways for growth. It means recognizing that today's trainees are tomorrow's chief engineers.

And it means telling these stories — so the industry can see itself moving forward. 



## **CHIEF ENGINEER MEMBER INFO AND REMINDERS**

Here are a few things to keep in mind about your membership and Chief Engineer events.

- Members are invited to monthly meetings that take place once a month October-May
- Meeting topics, speakers and times can be found online at [chiefengineer.org](http://chiefengineer.org)
- Membership dues are good for one year. If not renewed, your membership becomes inactive, and you will need to renew before or upon entering events

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Thank you to everybody who attended our December Holiday Event at Maggiano's on Clark last month. It was a robust turnout, and we're grateful not only that everyone showed up, but that everyone gave so generously to our annual charity appeal. This time, we chose to donate to Rob Meyer and the Muscular Dystrophy Association, who expressed their gratitude to the CEAC for all of our contributions. We express our own gratitude to our Events Committee for organizing everything, and of course to all of our sponsoring organizations, without whom memorable events like this would not be possible, including LionHeart, our Presenting Sponsor, Air Comfort, our Event Co-Sponsor, and our Bar Sponsors BEAR Construction, Chicago Filter Supply and Core Mechanical. We thank them most cordially and enthusiastically for their generosity.

This month, we hope to see all of you with your spouses and significant others in attendance at our Inauguration Gala, taking place Saturday, Jan. 24, at 6:00pm at Local 399 Union Hall. We'll be installing and celebrating our new slate of Officers and Directors for the 2026-2027 term. Registration is now open on the Events page at [chiefengineer.org](http://chiefengineer.org), and sponsorship opportunities are available. For more information or to ask about sponsoring this event or others, please email [events@chiefengineer.org](mailto:events@chiefengineer.org). 







## A Case Study in Relationships

By John Vastyan

It's no mystery that, in so many facets of business, personal relationships are the foundation for success. For one thriving mechanical contracting firm in Delaware, relationships run deep.

At Newark, Del.-based Schlosser & Associates, the importance of relationships is recognized, including long-term bonds with family, employees and customers — favorably, and with little distinction between them.

Recently, Steve Dennis, president of Newark, Del.-based Schlosser & Associates, visited with Glenn Slonecker, senior facilities manager for the spacious Siemens Healthcare Diagnostics campus in Glasgow, Del.

The two of them share the bond of friendship, both personal and professional. Their relationship spans a quarter of a century; Glenn has served Siemens for 52 years. During that time, all three of Steve and Garnet Dennis' sons have spent time working at Siemens under the tutelage and mentorship of Slonecker and others at Siemens.

Steve and Garnet co-own Schlosser & Associates, one of Delaware's leading, full-service mechanical contracting firms. Last year, their firm celebrated 71 years in business. Today, Steve and Garnet represent the second generation of family ownership; their sons, the third, fulfilling a rich legacy that has adapted, expanded and thrived for more than seven decades.

It's easy to see that the comfortable, easy relationship between Steve Dennis and Glenn Slonecker is one based on long familiarity, mutual trust and respect for the contributions of the other. Their conversations typically shift between shared recollection and work successes.

The family-oriented culture at Schlosser & Associates is further showcased through the commitment of the company's owners to their associates — not employees — most of whom have been with the firm for decades. It's a distinction that, by design, emphasizes tenure, commitment and collaboration. Currently employing 46 associates, the firm is dedicated to creating a supportive workplace — evident in their generous employee benefits, exceeding industry standards.

"We rarely struggle with the challenge of turnover," said Steve Dennis. "It's truly a blessing, borne in part of our deep commitment to our staff, associates, customers and vendors. As a result, we often get referrals for candidates to fill positions here. We've developed our workforce through the Delaware Apprenticeship program and also have deep roots in the communities we serve."

It helps that he and other staff members serve in volunteer roles locally and regionally. Steve Dennis was recently named president of the Delaware Contractor Association.

Schlosser & Associates does mostly commercial work, providing a broad mix of skills for commercial, industrial and residential customers across Delaware, Maryland and Pennsylvania.

Steve Dennis says that currently, their efforts consists of 60 percent commercial work, 20 percent industrial, and 20 percent light commercial and residential service work. The firm offers a diverse suite of services including HVAC, hydronic, plumbing and process piping, structural steel, concrete work, basic carpentry and painting, and indoor air quality solutions.



Logan Cook (Apprentice) and Kyle Knotts (Mechanic) arrive at the Siemens facility to perform routine maintenance.



Schlosser & Associates' commitment to its associates — not employees — leads to a sense of commitment that has the team rarely struggling with turnover.

Steve and Garnet's young adult sons are now well on their way to assuming leadership roles within the firm. Their youngest, Justin — who worked at the Siemens site for six years — is now a commercial estimator. Zach, now operations manager at the firm, worked for Glenn Slonecker at Siemens as a quality engineer until February 2024. Chris, who also enjoyed his time at Siemens under the guidance of Slonecker, now serves Schlosser & Associates in the field as an estimator.

### Jobsite Successes, Recipe

Steve Dennis confirmed that other facets of their work adds to the company's stability. They've more or less standardized on a recipe including the products and technology they install. Favored technologies include Bryan steam boilers, EVAPCO cooling towers, Trane chillers, Air+ air purifiers, Metalair VAVs, Innovent and VTS, air handlers, Watts backflow assemblies (Steve and several others within the company maintain their backflow certifications); Taco manufactures the pumps, circulators and hydronic components of choice.

"When things work well — or don't — we shift to other products, improve, learn and sharpen our skills," added Steve Dennis. "We've learned a lot through decades of careful management. When you're in the business for the long term, as we are, it's rather amazing how that sharpens our focus on maintaining the success, reliability and predictability of our work."

There's no better way to examine a company's dedication to craft than to look at examples of their work. Clearly, every project is different, though Schlosser & Associates' managers have found that certain facets of their performance — from how they work as a team, how they integrate with other trade pros on jobsites, and the tools and equipment they reach for routinely — all have an impact.

### Siemens Health Care Diagnostics

At the sprawling Siemens campus just south of Wilmington, Del. — once one of the main sites for DuPont — there are several

buildings, some of which include laboratories and clean rooms requiring very specific air quality requirements. Here, working in concert, Steve Dennis and Siemens' Glenn Slonecker — among many others — maintain a complex network of advanced mechanical systems.

According to Slonecker, there's a mile of subterranean 18-inch supply and return fiberglass pipe on campus, connecting chilled water to facilities for space conditioning, and specific process needs, many of which require tightly-controlled dehumidification, allowing the presence of atmospheric moisture at levels of 0 to 10 percent. That's dry.

"We test a lot of medical products and diagnostic consumables," explained Slonecker. And because their 1,000-plus employees on campus are working two or three eight-hour shifts each day, there's little or no downtime. Mechanical systems that provide and distribute chilled water play a key role in maintaining full, operational status, and redundancy is important.

On campus, there's a 1,500-ton Trane chiller connected to a similarly-sized dual-cell, AT induced draft, counterflow EVAPCO cooling tower. In fact, nearby — serving similar needs — are 550-ton, 450-ton and 350-ton chillers, all working in tandem with EVAPCO cooling towers. A few years ago, Slonecker made a trip to EVAPCO's headquarters in Taneytown, MD with Chris Delp, sales engineer, and other members of the rep firm that serves them, West Chester, Penn.-based Energy Transfer Solutions (ETS).

"I learned a lot during my visit to EVAPCO's manufacturing facility," said Slonecker. "Seeing firsthand their quality control, and the rigorous nature of their production affirmed our choice in EVAPCO as our standard for large cooling towers. We also have a strong, tenured relationship with ETS."

At the Siemens site, there's also a complex network of domestic and process water piping that serves the many facilities there. Surprisingly, most of the water comes from groundwater wells on site. Well water is pumped into a 400,000-gallon holding tank; distribution piping runs from it to all campus facilities.

Slonecker said there are 20 or 30 backflow assemblies installed and routinely maintained and tested to guard against the risk of backflow. "All of them are manufactured by Watts in 2-, 3- and 4-inch configurations. Fortunately, Schlosser & Associates shares our preference for these," added Slonecker.

### Kirk Middle School

The Kirk Middle School is a public school located in Newark, Del., serving 740+ middle-school students in grades six to eight in a large, suburban setting.

According to Schlosser & Associates President Steve Dennis, Kirk School now has three 165-ton cooling towers that are used for comfort cooling throughout the school. He added that Schlosser has worked for the school district for four or five decades.



A complex network of domestic and process water piping serves the many facilities at the Siemens site.

Cory Marshall, Schlosser’s commercial projects manager, has served the firm for more than 40 years. He supervised the work at Kirk Middle School.

“We’ve installed EVAPCO cooling towers for years,” said Marshall. “I’ve visited the factory and have always found the factory, sales representatives and start-up crews to be attentive

and very knowledgeable. Assembly of their units always goes smoothly and the need for callbacks is practically nonexistent.”

“Backflow assemblies are crucial for preventing contaminated water from entering the public water supply, protecting public health and ensuring compliance with regulations,” said Steve Dennis. “They act as one-way valves, stopping water from flowing backward into the clean water system, which can occur due to pressure changes or other factors.

“We’ve standardized on Watts backflow assemblies,” he added. “We’re always happy when we see that a facility has Watts backflow preventers. We consider them the very best backflow devices on the market and prefer to install, service and test them.

“Which, in a sense, brings us right back around to the importance of relationships,” concluded Steve Dennis. “Our performance on the job, and the trust we establish in building business relationships, depends not only on the quality of our people, but also our expertise and reliability. We’re in the business for the long haul, and that places important dependence on the quality of products and services we provide.

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# Making People Comfortable: Automatic Mechanical Services

By Karl J. Paloucek



*Working underfloor was just one of the challenges that Automatic Mechanical Services met while recently working at a live data center.*



Atomatic Mechanical Services' headquarters in Arlington Heights, designed by President Steve Stachorek.

It's not every day, when conducting an interview with one of our Associate Member organizations, that the president will pull in a bunch of staff members and allow them to share in being the voice of the company. But Steve Stachorek, President of Atomatic Mechanical Services, isn't your average president, and Atomatic Mechanical Services is anything but ordinary. What's obvious that they are, though, is communicative and collaborative.

The business was founded in 1945 with an entirely residential focus. Since then, it has passed through several owners over the generations before Stachorek finalized his purchase of the company in 2024. In the roughly 12 years since he joined the organization, he has seen Atomatic Mechanical Services grow four times the size it was when he started.

"Dick Hoffman, the previous owner, had a strong service background, and we built a very robust service group, so we do a lot of maintenance, a lot of repairs," Stachorek explains. "Commercial stuff — buildings all in the city and suburbs. And Bryan [O'Neill, Vice President of Construction] here, along with myself, has kind of helped us grow our commercial construction side of things. Because when I came in, we were doing just box warehouses, for the most part. And now we're doing hospital work, a lot of health care. We've always done office buildings. We're doing those, now. Lately it's been data centers."

It's an impressive scope — at the same time that the Atomatic Mechanical Services team is working on high rises, data centers, hospitals and health care, and more, they still maintain their presence in the residential market, something relatively rare in this industry. But it represents the roots of the business, and it's something of which Stachorek and his staff are very proud. "Our residential group is, I think, top-notch," he says. "We also compete with non-union competitors, because we get a special rate from

the union — they help us out. So we're giving them the commercial quality that everybody knows, but on the residential side. You could look at our Google rating. It's off-the-charts good."

And the scope continues to expand, as they recently added plumbing to their toolbox of services. Clients already familiar with the level of service they receive from Atomatic Mechanical on their HVAC systems now can expect equal focus on whatever plumbing issues they might face. "Maybe you need maintenance on your water heater, or your booster pump, or you might need a backflow preventer, certification — we do all of that," Stachorek says.

"But the markets we're in, if you can think it, we can do it," he continues. "I think the biggest thing that separates us is, we like to use our brains. I feel like, if it's complicated, we're really good at it. We can figure stuff out."

This agile, nimble thinking not only is germane to their work in the field, but manifests in their strategy and teamwork for helping the business to be as dynamic and successful as possible. Their entry into the data center market is a solid case in point, as Sales Engineer Paige Fugger explains.

"I went to a 7x24 conference and I actually met a data center operator there who oversees the product solutions at their facilities," she recalls. "I was just talking to him about my experience, what I was seeing in health care, getting on Zoom calls with surgeons, seeing how Bryan was performing shutdowns at major hospitals, and telling him about how we handle very critical type of work, and how we really are focused on reliability and continuity."

It was a perfect lead-in — the data center operator's team had a project involving direct liquid cooling that they had never attempted, and he wanted to bring in the Atomatic Mechanical



*When a client needed to push chilled water through the racks at their data center Atomic Mechanical Services' team devised a solution involving a storage tank and an N+1 redundant pumping system that led to the client asking them to reproduce the results at their data centers nationwide.*

team to take a look at it. "We ended up going to the data center, and I brought Bryan and some of our engineers. We actually worked hands-on with them, developing the final solution."

O'Neill interjected to describe the difficulties inherent in the job. "In this particular case, they're developing this AI robot that uses a lot of computing power, I guess, is the best way to put it. ... They have these major server racks that incorporate the latest cooling technology that brings the chilled water to the rack, to cool it down. The problem they brought to us was, 'We need to push

some chilled water through our new racks here. We have chilled water in the building, but we don't necessarily have the redundant pumping system to accommodate what they're looking for.

"They gave us the specs of the different racks and cabinets they were using," he continues. "We did a walk-through of their existing facility and got under the floor of their active data center to see, is there a route to bring this piping to the racks and what could we do here? So we kind of came up with a solution to basically build a storage tank and an N+1 redundant pumping system that would accommodate the pressure drops going through these server racks. It was a very tight schedule — we basically had 10 weeks, from design to completion, to put this thing together, because they move fast in the data center world. We took on the challenge. We actually used our fabrication shop to put our pumping skid together. We did a lot of underfloor investigation and 3D modeling to basically build it before we were onsite, in order to pick up efficiencies across the board."

The client even threw a bit of a curveball at the team, requesting to have six of the racks online at a moment's notice about halfway through the project. "That was another point in time we were able to put our heads together and actually build this manifold that was going to be able to accommodate those racks that sat above the floor while we were still working under the floor, trying to tie the system in," O'Neill says. "All in all, we got it done on time, and everything started up very well."

The success wasn't lost on the client, who responded by asking Atomic Mechanical Services to replicate the results on a larger scale. "We actually created the direct liquid cooling that they're going to be using at all of their facilities nationally," Fugger says.

O'Neill fully credits Fugger's astuteness for leveraging Atomic Mechanical's entry into data center work nationwide. "Paige mentioning our health care experience kind of sparked their interest, because working around sick patients is very similar to working around active data centers that have [comparable levels of sensitivity]. Our pipefitters went to town on it, and found out solutions also to capture the welding smoke, so it didn't go throughout the entire data center and get pulled into their other systems."

This is an exciting period of growth for the team at Atomic Mechanical Services. Not only are they expanding into areas of Northwest Indiana and Wisconsin for their self-performed work, and into the sphere of data centers on a national scale, but through their partnership with a peer group, Synergy Solutions Group, they're able to extend their reach to jobs across the country.

"It's really a partnership," Stachorek says. "The idea is, let's share ideas with people that we don't compete with. We've come up with a lot of good tools and things — open book on everything. So when we have an opportunity somewhere else, we partner with those [other member organizations] to get the job done."

But if there's one thing Stachorek makes clear, it's that while growth is happening, it's happening organically — not through its pursuit as a goal in itself. "I've said this from the day that we started: When it comes to growth, it's more, for me, about being



*Robust and collaborative thinking germinates in these halls.*

the best. Being the best means you can do anything. We can be in any market. We keep increasing our clients. We hire good people. When we do that, we're going to grow. We don't put the brakes on anything, but I never, ever had our sights set on focusing on growth."

That said, according to Stachorek, they're on an incredible trajectory, fueled in large part by the sterling service provided by their field technicians in every division of the business, from working on data centers all the way back to their roots in residential. In one recent instance, Stachorek describes, a residential technician, Ivan Vasquez, got out of his bed at 10:00 at night to assist a client whose furnace had stopped working. After initial troubleshooting over the phone failed to solve the problem, Vasquez eventually suited up and went to the client's home at 11:00pm to ensure that everything was in good working order.

Stachorek explained that he arranged for a special bonus for Vasquez for going so far out of his way to provide the service he did — as well as the reason why. "What I found out later is that the client happens to be going through cancer, and he's kind of weak," he says. "Our tech knew that, because they've become friends over the years, and he's like, 'I can't let this guy go a night without heat.' That speaks to two things: One, our culture, but also, we do like to reward these guys for going outside of their normal job."

During the course of our interview, the open and healthy culture at Atomic Mechanical Services not only came up as a topic, but it was obvious from the way everyone fluidly involved other departments and individuals as they talked about their own work and perspectives. For this group, collaboration is key, from securing business to maintaining it in the field.

"We always say that Sales will get us in the door, but our techs are the ones who really keep us in there," explains Lindsay Smith, Services Sales Executive. "The relationship that they have is what keeps us in the door, and that's why we're so successful. And the referrals, too. We got in with Loyola Hospital with construction, and now we have one of the largest service contracts with Loyola because of Construction, now is with Service. Service we can give to Construction and Controls, and Residential, but we all work together as a group — as a team."

Even newly onboarded Sales Service Executive Julie Benson, concurs with that view. "Everyone [here] works together. It's amazing. I met Adan yesterday, and he broke down what he was doing, and probably spent an hour with me, going through what he was doing, to teach me. I've reached out to all of the techs, and they have all taken the time to respond. A lot of companies say that it's all about the people, but it's been amazing here. ... Everyone is treated the same. They all get the same respect. That's what's different with this company."

For Stachorek, it all boils down to a core philosophy that he's made into a motto, and even an advertising slogan for the brand: "It says, 'We make people comfortable.' The idea behind that is, obviously as HVAC contractors, we make people comfortable with heating and cooling, but it goes beyond that for us, and when you talk about culture, it's about people feeling comfortable throughout the process. So if you're doing work with us, you should know we're going to get it done right. We're going to be fair in our pricing. We're going to get it done on time. And we're going to care. And we're going to treat you like a human being. It's really, at the highest level, about how we treat people." ■■



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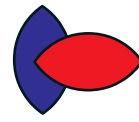
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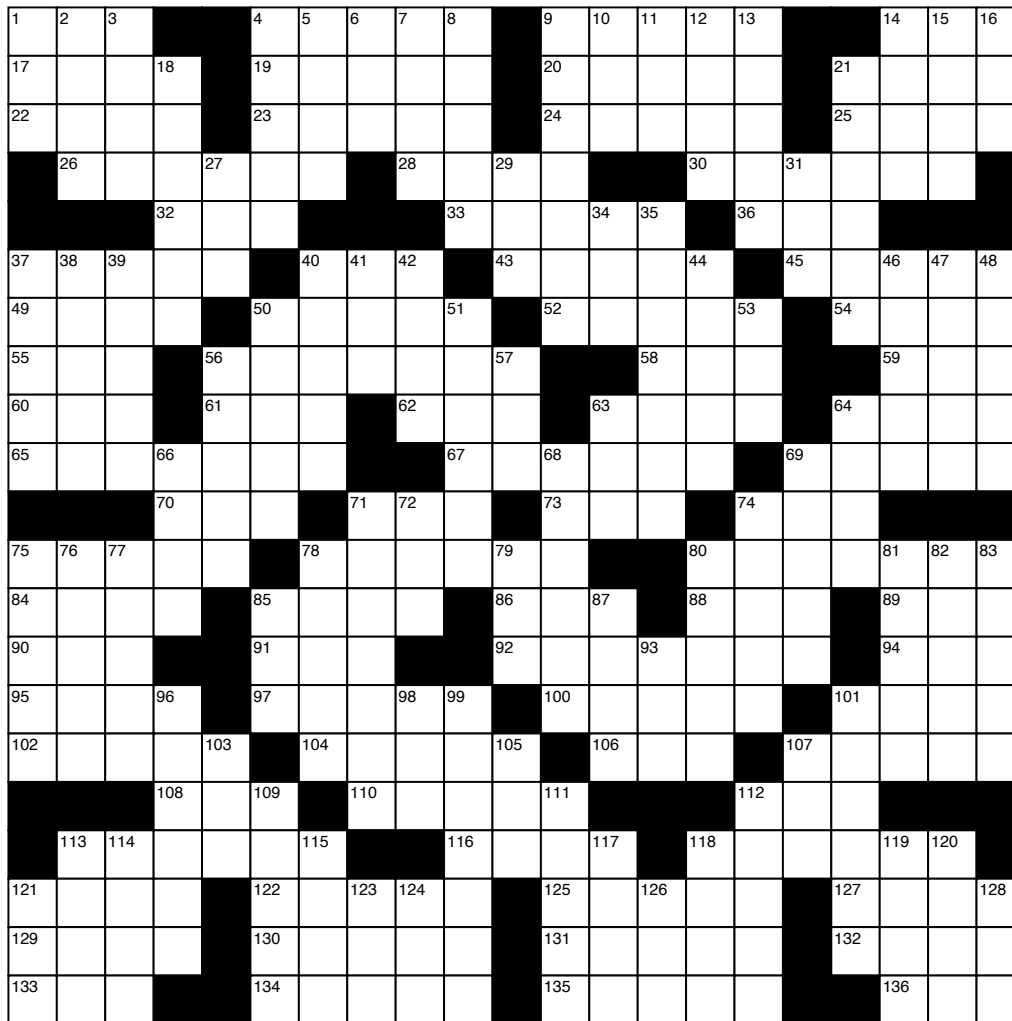
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## ACROSS

- 1 Used to be
- 4 Japanese city
- 9 Jabs
- 14 Licensed practical nurse
- 17 Lotion ingredient
- 19 Refute
- 20 Plebe
- 21 Electron, for example
- 22 Herb
- 23 List of highly desired guests
- 24 Where two slopes meet
- 25 Malaria
- 26 Make messy (2 wds.)
- 28 Lotion brand
- 30 Cigarette user
- 32 Telegraphic signal
- 33 Mutiny
- 36 Take to court
- 37 Arching
- 40 Ashen
- 43 Annoys
- 45 Clothes pressers
- 49 Oceans
- 50 Title of Islam's head
- 52 Got up
- 54 Pack
- 55 Attack
- 56 Yellow toll car
- 58 Sheet
- 59 Color
- 60 Halloween mo.

- 61 Single
- 62 Time zone
- 63 Cleanse
- 64 Ward off
- 65 Hair knot
- 67 Arrow poison
- 69 Foal
- 70 Yes
- 71 \_\_\_ Lanka
- 73 Unpaired
- 74 Pouch
- 75 Goes without food
- 78 Weapon of war
- 80 Pope's home
- 84 Unpunctual
- 85 Ointment
- 86 Grain
- 88 Lager
- 89 Lode yield
- 90 Epoch
- 91 America
- 92 Knotty
- 94 North by west
- 95 Against
- 97 Ladies
- 100 Narcotic
- 101 Id's counterparts
- 102 Express indifference
- 104 Puts together
- 106 South by east
- 107 What a horror movie is
- 108 Cell stuff
- 110 Looks for
- 112 Movie star Taylor

- 113 Summer month
- 116 Binds
- 118 Wordlessly
- 121 Aged
- 122 Shrub
- 125 Potter's needs
- 127 Mangle
- 129 Smell
- 130 Cain's eldest son
- 131 Contaminate
- 132 American Civil Liberties Union (abbr.)
- 133 Decade
- 134 Bitter herb
- 135 Spread out
- 136 Container

## DOWN

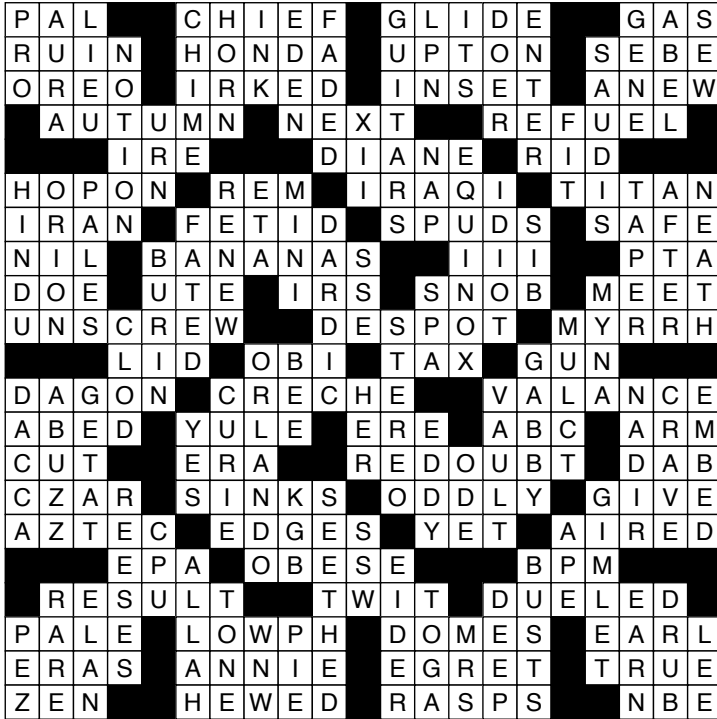
- 1 Compact bundle
- 2 First letter of the Arabic alphabet
- 3 Fly alone
- 4 Brat accompaniment, for short
- 5 Bark
- 6 Kimono sash
- 7 Elephant tooth
- 8 Swimming mammal
- 9 Writers
- 10 Thai
- 11 Total
- 12 Prays
- 13 Plant trunks
- 14 Sled

- 15 Pelt
- 16 North northeast
- 18 Hedges
- 21 Creators
- 27 Topper
- 29 Pastor (abbr.)
- 31 French "yes"
- 34 Extension (abbr.)
- 35 Spotted cat
- 37 Association (abbr.)
- 38 German kingdom
- 39 Spiny plants
- 40 Made of wax
- 41 Boxer Muhammad
- 42 Naughty or \_\_\_ (what Santa checks)
- 44 Figure out
- 46 The one left
- 47 Places
- 48 Swedish citizen
- 50 Long, skinny boat
- 51 Band of color
- 53 Imbue
- 56 Frozen pizza brand
- 57 Energy unit
- 63 Fellow
- 64 Central points
- 66 Fence opening
- 68 Italian cheese
- 69 Scorned
- 71 Salted sausages
- 72 Revolutions per minute
- 74 Witch hunting city
- 75 Animal insects

- 76 Express disgust
- 77 Elevator alternative
- 78 Whining speech
- 79 Record
- 80 Price
- 81 Dance
- 82 Shelter under branches
- 83 Gossipy
- 85 Friend
- 87 Raps lightly
- 93 Eve's beginning
- 96 Poker
- 98 East northeast
- 99 Unclear
- 101 Skin problem
- 103 African antelope
- 105 Winter sport
- 107 Perch
- 109 Forte
- 111 Cliques
- 112 Strong
- 113 Military officer
- 114 On
- 115 Canned meat
- 117 Strike
- 118 Asian bird
- 119 Want
- 120 Christmas
- 121 Molder
- 123 First day of wk.
- 124 American Cancer Society (abbr.)
- 126 Cause of sickness
- 128 Tote

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