CHIEF ENGINEER™

SEPTEMBER 2025

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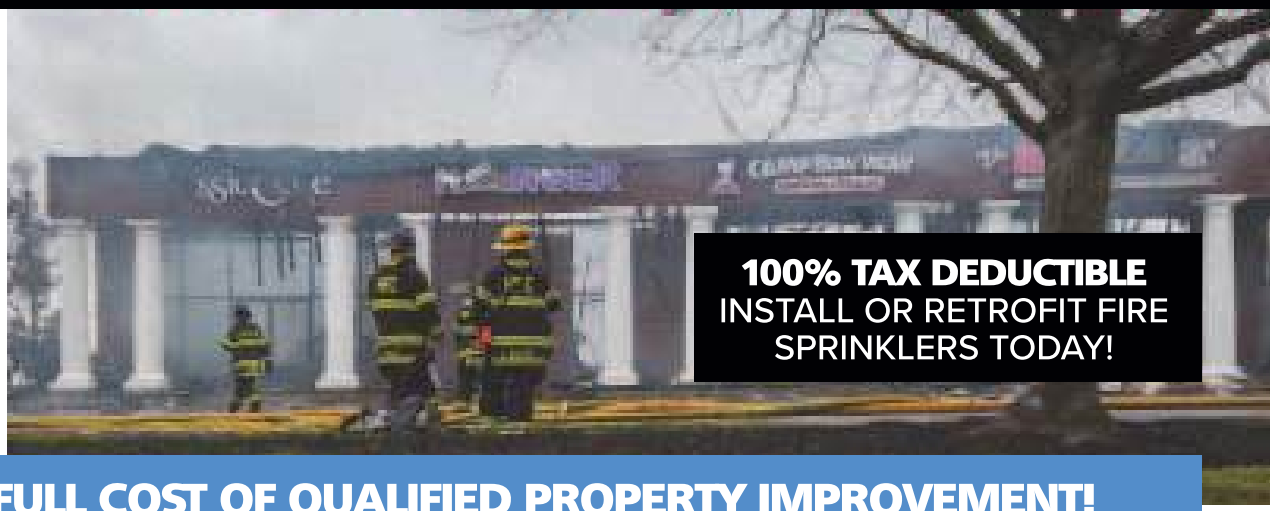
DON'T LET YOUR BUSINESS GO UP IN FLAMES!



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.

F.P.C.
FIRE PROTECTION CONTRACTORS

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DON'T LET YOUR BUSINESS GO UP IN FLAMES!

The Fire Protection Contractors work on all aspects of fire protection systems. Starting with the initial design of your system to the installation we are with you every step of the way. Almost as important as installing a fire sprinkler system is the routine maintenance. This includes inspection and testing to ensure the system is working and, in most areas, required by law.

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PRESIDENT'S MESSAGE

Dear Members,

I hope you all enjoyed your summer break and found time to make some great memories with your families and loved ones. It was a hot one, certainly, and one in which we really needed our cooling systems to be at peak performance. Much cooler temperatures are not far off, and we'll want to make sure our boilers are prepped and ready for what's to come. As always, if you find you require outside help for getting them in shape, or for anything else, please remember to consult your QuickShopper. Our Associate Members are the professionals you need, and we like to support them just as they support us at the CEAC.

It's almost time to hit the links! Our 85th Annual Chief Engineers Golf Outing will take place Friday, Sept. 12, at Cog Hill in Lemont, as usual, with a 9:00am shotgun start. If you haven't signed up your foursomes yet, please do so ASAP — this is the biggest event of the year for the CEAC, and we don't want anyone to miss out. Sponsorships are still available at the time of this writing, so if you're looking to support or participate in this great day out, please visit the website at chiefengineer.org/events/golf-outing or reach out to golf@chiefengineer.org with any questions you might have.

We're already looking forward to our Oktoberfest meeting next month, with plenty of beer, great German food and Gemütlichkeit. The event will take place Wednesday, Oct. 15, from 4:00-7:00pm, at 115 Bourbon St. (3359 W 115th St, Merrionette Park). This is another of our more popular meetings of the year, so if you're interested in registering a sponsor, it's a great opportunity to connect with the membership. Registration is now open, so please sign up and the Events page on the website at chiefengineer.org so we can get as accurate a head count as possible.

We would like to thank everyone who participates in the daily life of the CEAC, and to those who take the time to read the Chief Engineer magazine, and who make time for us when we reach out for interviews and stories about your projects and your businesses. We like to keep the editorial focus on our members and member organizations as much as possible, so I'll just ask once again that if there's something you're working on that might be of interest to our whole readership — a particularly challenging retrofit, a project at a prominent Chicago property, or something that requires highly specialized knowledge and expertise — to please let us know. Reach out to publisher Tom Phillips at tphillips@chiefengineer.org or to the magazine's editor, Karl Paloucek, at kjpaloucek@gmail.com and help them to spread the word!

Enjoy these waning days of summer. We'll see you out at Cog Hill!

Sincerely,

Doug Kruczek

Doug Kruczek

ASHRAE and UNEP Launch Sustainability Assessment Tools for Refrigeration and Air-Conditioning Plants

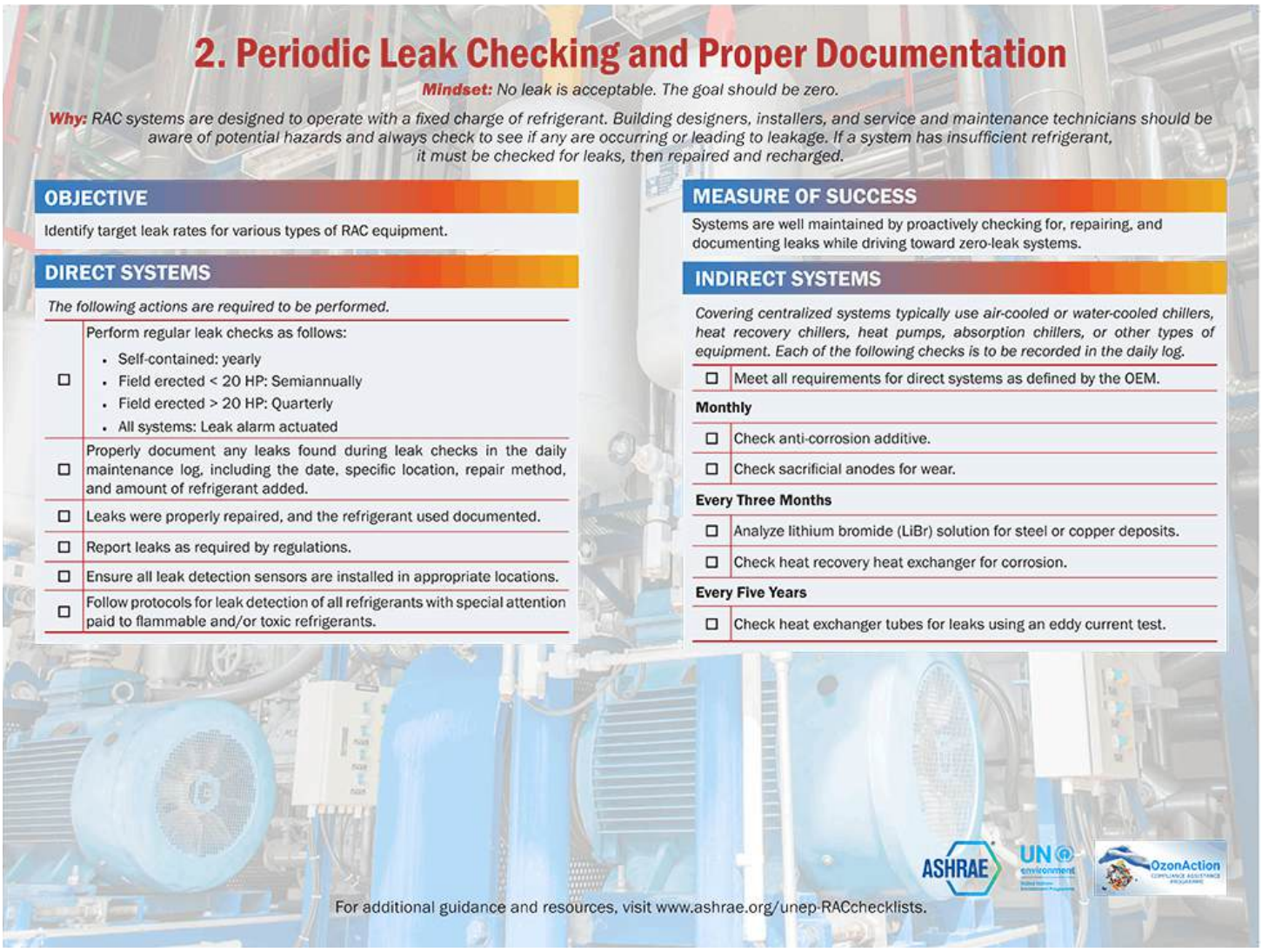
ASHRAE and the United Nations Environment Programme (UNEP) OzonAction have released the Assessing RAC Plant Sustainability checklists and guidance sheets. These free, downloadable, easy-to-use tools are designed to help refrigerating and air-conditioning (RAC) plants improve performance, reduce emissions and promote energy-efficient, sustainable operations.

Proper maintenance and operation of RAC plants remain a significant challenge due to increasingly complex systems, evolving technologies, and the introduction of new refrigerants requiring specialized knowledge and handling. The Assessing RAC Plant Sustainability tools provide practical support in addressing these challenges.

"These tools provide practical guidance that connects design intent with operational outcomes," said 2025-26 ASHRAE President Bill McQuade, P.E., CDP, Fellow ASHRAE, LEED AP. "By helping RAC professionals assess and improve sustainability across key performance areas, we're empowering the industry to make data-informed decisions that benefit the environment, their workforce and their bottom line."

Originally designed for field technicians, the tools also offer value to plant managers, equipment suppliers and consulting engineers:

- *Plant Managers* can assess current operations across eight key dimensions, including refrigerant emissions, energy consumption and preventive maintenance, using the tools to make informed sustainability improvements and reduce operating costs.
- *Suppliers* can train customers in preventive maintenance strategies that increase equipment life, efficiency, and compliance, while supporting life-cycle cost savings and performance accountability.



New ASHRAE and UNEP checklists and guidance sheets support performance, compliance and sustainability for technicians, engineers, suppliers and plant managers.

- *Engineers* can incorporate the checklists into training documentation, strengthening the connection between design objectives and real-world operations, while closing knowledge gaps among stakeholders.

The guidance also includes recommendations for energy-efficient operation, life-cycle investment considerations and key performance indicators to help determine when equipment upgrades are warranted.

This resource is part of a broader portfolio of ASHRAE-UNEP tools developed to promote responsible, efficient cooling practices and support international efforts related to the Montreal Protocol.

Explore the full suite of resources through the ASHRAE UNEP Portal at www.ashrae.org/professional-development/ashrae-unep-portal

2025 ASHRAE Building Decarbonization Conference Oct. 22-24, 2025 Chicago, Ill.

The 2025 Building Decarbonization Conference will be an information and idea exchange between stakeholders in the built environment industry concerning the reduction of GHG emissions in new and existing buildings and systems. This is ASHRAE's 4th building decarbonization conference and will feature a significant focus on strategies and solutions for scaling up building decarbonization. The scope of the conference will cover a range of buildings from residential to small, medium and large commercial buildings to campus and portfolio buildings. The conference will bring together engineering and technical solution providers with building owners, utility program managers, local governments and financial services providers who are increasingly challenged to meet stringent building decarbonization goals, policies and regulations in a practical, cost-effective manner.

The technical program for the 2025 Building Decarbonization Conference is a mix of invited speakers and accepted submissions to an open call for abstracts. The program will cover but is not limited to the following topics:

Scaling Decarbonization: Transitioning From Bespoke Solutions to Broad Implementation

- Scaling decarbonized new construction (residential and commercial)
- Scaling building decarbonization retrofits
- Scaling at the regional level or across multiple buildings (campus, portfolio) and systems
- Special considerations in scaling building decarbonization in rural and underserved communities

Innovators' Showcase: Success Stories and Cutting-Edge Tech (Best Practices, Case Studies, and Evolving Technologies)

- Whole-life carbon best practices, resources, tools, and case studies
- Cold climate design, construction, operation, and end of life considerations including hybrid heating solutions
- Evolving heat pump technology roll-up, new refrigerants, new capabilities, etc.
- Retrocommissioning with low-cost and scalable solutions

Beyond Decarbonization: Flattening Utility Demand, Considering Resilience, and More

- Managing peak electric loads from building electrification — demand reduction, thermal storage, DER integration, demand flexibility
- Pairing decarbonization with resiliency and enhanced IEQ
- Critical facility challenges
- Equity considerations in decarbonization

Blueprints for Change: Policies, Standards and Programs

- Building decarbonization through utility programs — new construction, retrofits
- Policies and Standards, including building energy codes and Building Performance Standards
- Financing solutions for building decarbonization in new construction and retrofits — net zero as a service, ESPC, PACE, green mortgages

For more information or to register, visit tinyurl.com/mupb85e6

MISERICORDIA
HEART OF MERCY

Langehaumer Charities Hosts Annual Golf Outing Benefiting Misericordia

This summer, Langehaumer Construction held its 2025 Langehaumer Charities Golf Outing at the Chevy Chase Country Club in Wheeling, Ill. Since 2017, through its annual golf outing, Langehaumer Charities has donated more than $165,000 to support Misericordia's mission of offering a community of care that maximizes potential for persons with mild to profound developmental disabilities, many of whom are also physically challenged. By serving society's most vulnerable citizens, Misericordia also serves the families who want the best for them, who cannot provide it at home.

Langehaumer Charities supports this mission with the belief that we must give back to the communities we serve, and have an obligation to improve the lives of those who are in need. Langehaumer Charities encourages everyone to consider joining in its mission to improve the lives of those who are less fortunate by making a gift or becoming a sponsor of its annual golf outing. All proceeds go directly to Misericordia.

Through a spectrum of residential options on its 31-acre Chicago campus and in the community, and with a wide variety of programs, Misericordia currently serves more than 600 children and adults residentially, from diverse racial, religious and socio-economic backgrounds. Twenty percent of our residents either come from poverty families or have no families and are wards of the State.

Thank you, Langehaumer Construction, for your caring and generosity!

PREPARING FOR COMBUSTIBLE DUST EMERGENCIES AT FACILITIES

Any combustible material can burn rapidly when in a finely divided form. If such a dust is suspended in air in the right concentration, under certain conditions, it can become explosible. Even materials that do not burn in larger pieces, such as aluminum or iron, given the proper conditions, can be explosible in dust form.

The force from such an explosion can cause employee deaths, injuries, and destruction of entire buildings. For example, three workers were killed in a 2010 titanium dust explosion in West Virginia, and 14 workers were killed in a 2008 sugar dust explosion in Georgia. The U.S. Chemical Safety and Hazard Investigation Board (CSB) identified 281 combustible dust incidents between 1980 and 2005 that led to the deaths of 119 workers, injured 718, and extensively damaged numerous industrial facilities.

When there is a delay or setback during an incident, the risk of injury rises for facility workers as well as for emergency responders. Everyone is safer when facility and emergency personnel share information and develop safe procedures to handle incidents involving combustible dusts. Owners, operators, and the community also benefit from reduced property damage when incidents are handled quickly and safely.

How does a combustible dust explosion occur?

Firefighters are well aware of the elements of the "fire triangle": fuel, heat, and oxygen. (See Fig. 1.) In this case, combustible dust is the fuel. Oxygen is usually available in the ambient air. In addition to, or in place of the oxygen, another chemical oxidizer may simulate oxygen in the combustion reaction.

In school or training, you may have seen a demonstration involving a small container with flour or a similar material that was ignited, created a small fireball, and forced the lid of the container to lift. This can occur on a much larger scale in a building or confined space. When combustible dust in the proper concentration is dispersed in a cloud, and then ignited, a flash fire occurs. (See Fig. 2.) This flash fire is like a larger version of the fireball in the classroom demonstration. It is much more dangerous to humans than an ordinary fire because it spreads too quickly to outrun. You may hear the term "deflagration"; this is a type of flash fire that is strong enough to cause damage to equipment or structures.

When a flash fire is confined, the pressure that develops can cause an explosion, damaging or destroying the confining enclosure. (See Fig. 3.) This explosion is a larger version of the lifting lid in the classroom demonstration above. The confining enclosure could be processing equipment, a conveyor, a dust collector, a room, or an entire building. The flying shrapnel, blast wave and collapsing structural members resulting from the explosion can injure or kill individuals over a large area.

The blast wave can also disperse accumulated combustible dust in work or storage areas, fueling one or more subsequent explosions. These secondary explosions are often more destructive than the initial incident due to the large quantities of dust dispersed. Secondary explosions can continue to ignite in sequence, cascading throughout a facility.

What preparations can be made prior to a response?

Pre-incident Surveys

Emergency responders need to know about combustible dust hazards in advance. Many emergency response agencies routinely perform pre-incident surveys at facilities with special hazards. This allows responders, regardless of the size of the jurisdiction, to learn about the hazards, proper methods to handle emergencies, and the features in place to assist them — for example, water supplies, suppression systems, confined spaces and egress points. Emergency responders should treat combustible dust as a special hazard. All locations where combustible dust is used, including process or conveying equipment, produced — for example, cutting or grinding equipment — or stored should be identified in the survey.

Facilities can have a variety of materials, operations and procedures. During the pre-incident survey, it is important to collect facility-specific information on all of these aspects. This will make it possible to tailor emergency operations to a particular facility.

The pre-incident survey team should walk through the entire facility and consider each process, possibly by functional area, to identify the operations or components that generate, or could generate, enough dust to create a flash fire or explosion hazard. Fine dusts can even cling to vertical surfaces. A large amount of combustible dust often accumulates overhead

Fig. 1: Fire Triangle

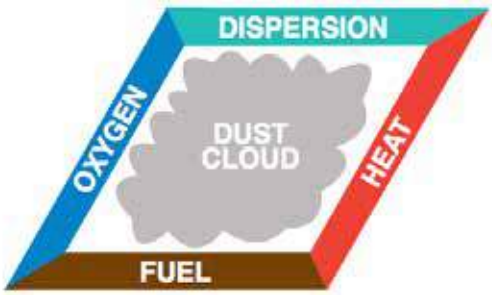


Fig. 2: Elements of a Flash Fire

Fig. 3: Explosion Pentagon

on structural components or other surfaces where it is hard to notice or clean. Historically, these dust accumulations are associated with cascading secondary explosions that lead to major or total facility loss.

Hybrid Mixtures

Emergency responders should be aware of the potential for hybrid mixtures. These are mixtures of flammable gas or vapor and combustible dust suspended in air. Hybrid mixtures can be explosible below either the lower flammable limit for the gas/vapor or the minimum explosible concentration for the dust. Processes can involve hybrid mixtures routinely or during abnormal conditions. Potential flammable gas and vapor sources include fuel pipes to heating equipment, fuel tanks on material-handling equipment, and flammable liquid containers. Flammable gas can also be produced when a fire's combustion by-products become mixed with suspended dust. For example, carbon monoxide is a product of incomplete combustion and is a toxic, flammable gas often produced in dangerous amounts by smoldering fires. Any of these flammable gases or vapors can form hybrid mixtures with combustible dust. Hybrid mixtures often migrate and become trapped by building features or equipment. Responders should be aware of ceiling height and potential trap areas.

Combustible dust accumulated on overhead structural components historically has been associated with cascading secondary explosions that lead to major or total facility loss.

Protection Systems

Equipment and buildings with known combustible dust hazards should be equipped with devices or systems to prevent an explosion, minimize its propagation, or limit the damage it causes. Examples include relief vents or abort gates that direct damaging pressure or burning material out of a confined area, and isolation devices that prevent damaging pressure or fire from extending to another piece of equipment. Facilities can use special high-speed detection and suppression systems as well as oxygen-reduction systems. The team should note all these devices and systems in the pre-incident survey; this will let emergency responders support the systems or avoid making them ineffective during an incident.

Both fire and explosion hazards of combustible dusts are often present in a facility. Ordinary fire suppression systems can be installed to address fire hazards. When such systems are provided in areas with explosion hazards — such as a silo or dust collector — they will only be effective for a fire and not for an explosion. These situations should be noted during the pre-incident survey.

Buildings with known combustible dust hazards should be equipped with relief vents or abort gates to direct damaging pressure or burning material out of confined areas.

Facility Liaison

The facility's staff is usually the best resource on the nature and extent of hazardous dust conditions present. To get a complete and accurate accounting of the materials, processes, and potential hazards, those performing the pre-incident survey will often need to discuss these issues with multiple members of the facility's organization. Staff from the safety, operations, maintenance, production, and facility engineering departments can provide valuable input, as can employee representatives.

Facilities should designate a specific person responsible for updating the emergency responders on any changes that affect the hazards at the facility. Ideally, this representative, and one or more alternates, will also be available as emergency contacts. An on-site liaison should report to the incident commander at the start of an emergency operation.

Emergency responders should obtain contact information for all facility emergency contacts, storing this information in a way that facilitates rapid communication during an incident. Facilities should ensure that any changes in representatives or their contact information are communicated to response agencies.

It is also a good idea for emergency responders and facility personnel to train together regularly. Knowing each other and the facility will promote a more efficient and effective response if an incident occurs.

Source: U.S. Chemical Storage

The cost of NOT protecting high-rise buildings with fire sprinklers.

Two years after the fatal Harper Square fire, the trauma continues as residents in more than 80 units remain displaced.

On January 25, 2023, the Harper Square fire was the first of 17 fires in unsprinklered high-rise residences in Chicago that year. It resulted in one fatality, multiple injuries, hundreds of residents displaced, and millions of dollars in property loss and displacements. For Harper Square residents, the last two years have been a time of uncertainty, stress, frustration and exhaustion as costs mount and insurance coverage has been exhausted. Unfortunately, a similar tragedy could strike again since fire sprinklers are not being retrofit during reconstruction after the fire.

All 17 buildings were built before the 1975 City of Chicago Code requiring fire sprinklers in all new high-rises. Today, more than 600 residential high-rise buildings in Chicago stand without fire sprinkler protection, with cost often cited as the reason not to retrofit fire sprinklers. **The real question is, "What is the cost of NOT installing fire sprinklers when a fire occurs?" Harper Square is a model example of post-fire costs far exceeding the cost of installing fire sprinklers.**

Fire sprinklers prevent these tragedies. Heat from a fire individually activates each sprinkler to extinguish or control the fire while it is small, allowing residents to safely escape. Fire sprinklers are the most effective solution to reduce fire risk, protecting residents, firefighters and property.

Two years after the Harper Square fire, it is clear the life- and property-saving benefits of fire sprinklers far outweigh the staggering, ongoing costs of a tragic fire without them.

Is your high-rise fully protected with fire sprinklers?

Northern Illinois Fire Sprinkler Advisory Board
FireSprinkerAssoc.org
708-403-4468

Lessons From the Frontlines: Surviving 100-Degree Days Without Meltdowns

How Chicago's Chief Engineers Prepare Their Buildings to Perform Under Extreme Summer Heat

By Michael A. Badame

Jeff Edeus, Chief Operating Engineer at 875 N. Michigan Ave., ensures that the chillers and fan systems are already running at peak efficiency prior to peak demand on extra-hot days. "Starting big loads during peak time is asking for trouble."

Introduction: The Rooftop Furnace

On a blistering July afternoon, the rooftop of 875 North Michigan Avenue — still known to many Chicagoans as the John Hancock Building — was a place only the bravest ventured. Up here, the sun doesn't just shine — it attacks. The black membrane roofing radiated heat like a griddle, and the air shimmered above the cooling towers. Rooftop temperatures flirted with 130°F. The city far below baked under the haze, its streets and sidewalks giving off waves of heat that rose to the sky.

Inside, the massive chillers were humming in unison, each working at full tilt to keep nearly 100 stories of office, retail, and observation space livable. Beyond the commercial tenants, Jeff's team also supplies chilled water to the building's residential condominium portion, ensuring hundreds of private units stay comfortable during extreme heat. Jeff Edeus, Chief Operating Engineer, had his eyes on the BAS (Building Automation System) readouts, where every degree mattered.

"We knew this was going to be one of those days," Jeff says. "The forecast had triple digits, ComEd had already declared peak demand hours from 3:00 to 6:00pm, and every square foot of this building was going to demand cooling."

It's a situation Chicago Chief Engineers are encountering more often. According to NOAA data, extreme heat events in the Midwest have increased in both frequency and duration over the last 20 years. In Chicago, what used to be a one- or two-day anomaly now stretches into multi-day runs of triple-digit temperatures, with no nighttime relief.

For Chief Engineers, that means longer hours, tighter margins for error, and more reliance on contingency planning. This story isn't just about one hot day — it's about how a veteran Chief and his crew stayed in control when the building, the weather, and the grid all conspired against them.

War Stories: When the Heat Got Real

That particular week started hot and stayed hot. By day three, the asphalt streets looked soft enough to dent with a boot heel, and the HVAC load in high-rises like 875 North Michigan was at seasonal maximum.

"Fortunately, we didn't have any major failures," Jeff recalls. "But that's not by accident. We had all our systems online well before peak hours. By 2:30pm, every chiller, every tower fan we needed was running. We'd already raised temperature setpoints in vacant suites, closed blinds in unused areas, and made subtle changes to lessen our cooling load."

The strategy wasn't just about cooling — it was about timing. "We were informed that most of the 'hot' days would be peak demand days from 3:00pm to 6:00pm," Jeff says. "We made sure everything was already running at peak efficiency before those hours hit. Starting big loads during peak time is asking for trouble."

In a building this size, the margin between comfort and chaos is razor thin. One failed condenser pump or a tower cell out of service on a day like that can cascade into floor-wide temperature spikes. Jeff's team leaned heavily on the BAS for real-time adjustments.

"Monitoring areas throughout the property allowed us to make small tweaks — sometimes just a degree or two — that took enough load off the towers and chillers to keep us steady," Jeff says.

And when the stakes are that high, communication is just as critical as mechanical performance. The management team knew the plan. Security, tenant services and engineering were in sync. "When your tenants understand what you're trying to achieve — reducing operational costs and preventing shutdowns — they're more willing to work with you," Jeff says. "We saw people closing blinds on their own and not running unnecessary equipment."

By the end of the week, the building had not only maintained comfort but also avoided costly demand penalties from the utility — a win on both fronts.

Tactics That Work: What the Best Chiefs Do Differently

Some buildings sail through heat waves; others limp along with emergency calls and tenant complaints. The difference usually comes down to strategy, discipline, and a little creative thinking.

From Jeff's playbook and insights from other seasoned Chiefs, here are the approaches that consistently make the difference.

1. Pre-Season Tower and Chiller Prep

A cooling tower fouled with scale or biofilm won't shed heat efficiently, no matter how fast the fans spin. "We make sure all tower basins are cleaned, strainers pulled, and gearboxes serviced before the first warm spell," Jeff says.

This summer, rooftop temperatures at 875 N. Michigan Ave. peaked at just under 130°F.

KNOW THIS! In Illinois, cooling tower maintenance is also a public health issue. The Illinois Department of Public Health (IDPH) and OSHA guidelines require regular inspection and treatment to minimize Legionella risk. That means maintaining proper biocide residuals and documenting tower cleanings.

2. Smart Load Management

In extreme heat, every unnecessary ton of load is your enemy. Jeff's team raised setpoints in vacant spaces and cut solar gain by closing blinds. "It's simple stuff, but across a million-plus square feet, those small moves add up," he says.

Best practice tip: Even a 1°F increase in cooling setpoint can reduce chiller load by 2-4 percent.

3. BAS Overrides for Peak Hours

Automation is powerful, but sometimes the default programming works against you on peak days. "If something's starting too early or cycling inefficiently, we'll take manual control for that day," Jeff explains. "The goal is to have all required equipment running and stabilized before the grid hits its highest strain."

4. Portable Contingencies

While the John Hancock's systems held, Jeff keeps portable A/C units ready for tenant emergencies. "We've got units on hand so if a tenant's supplemental A/C fails, we can respond immediately," he says.

Mike Meissner, Branch Manager at Spot Coolers, says the key to deploying temporary cooling successfully is planning ahead.

"We operate 42 locations nationwide, and we can deploy dozens of portable units within a few hours," Meissner says. "But if you wait until the failure happens, you're already behind. You need to know your space load, available power, how you'll reject the heat, and how you'll handle condensate before you order equipment.

Spot Coolers serves a wide range of industries — retail, healthcare, restaurants, industrial, education and commercial — and offers units from 1-12 tons. "In a heat wave, demand spikes for everybody. The people who have a plan in place will know what to order to ensure rapid deployment of an effective solution to their sites. Meissner says.

5. Communication Loops

A peak day isn't the time to send emails into the void. "During that heat wave, we increased communication with our management team," Jeff says. "Every department was on board, and that made a huge difference."

That coordination extended to contractors as well. Knowing which vendors could respond quickly and having pre-approved work orders in place meant no time was lost to paperwork when speed mattered.

Common Mistakes That Lead to Meltdowns

Not every building fared as well that week. Jeff points out the traps that trip up even experienced teams:

- **Failing to flush condenser** loops before the season, leaving debris to clog strainers and foul heat exchangers.
- **Skipping airflow balancing** after offseason work, which can cause hot spots and overworked zones.
- **Uncoordinated tenant requests** that spike load unexpectedly during peak hours.
- **Poor staging logic**, where automation starts towers or chillers too late to meet the surge.

One overlooked issue during the Hancock's heat wave? Chilled water valve performance. "Verifying proper operation of those valves proved critical to lowering electrical consumption when needed," Jeff says. "A stuck valve can rob capacity and send you chasing phantom load problems."

Planning for the Next Heatwave

Every extreme weather event leaves lessons for the next one. Jeff's list includes:

- **Potential BAS Upgrades:** "If our efforts prove positive once we see the electrical bills, I'd like to work with Siemens to program a 'point and click' feature so on-shift operators can make changes without missing something," he says.
- **Staffing Adjustments:** Shifting exterior work to nights, staggering starts, and increasing monitoring during critical hours.
- **Data-Driven Decisions:** "Numbers don't lie," Jeff says. "Document everything. Show your team the impact of their efforts — it builds confidence and better habits."
- **Tenant Engagement:** Pre-season tenant briefings on peak-day protocols can reduce complaints and improve cooperation when you need it most.

At 875 N. Michigan Ave., 1.5-ton, 115v water-cooled spot coolers are on hand in case of a tenant emergency.

According to Jeff Edeus, the keys to navigating your building's way through a heat wave with greatest efficiency involve preparation, teamwork, and the willingness to adapt in real time.

Mentors and Influences: Jack O'Rourke's Lasting Impact

Jeff credits much of his operational mindset to industry veteran Jack O'Rourke. "One of my first interviews for an apprentice position was with Jack," Jeff recalls. "He thought I'd be a good fit at 300 S. Riverside Plaza, and fortunately I was hired. Over the years, whether I was at Tribune Tower, 540 W. Madison, or here at 875 N. Michigan, Jack has always been there. Anytime I've had an emergency, he offers advice and says, 'Whatever you need, you got it,' and he stays in touch until the issue is resolved."

That kind of industry camaraderie — experienced Chiefs mentoring the next generation — is one of the quiet strengths of the Chicagoland engineering community.

Quick Reference: Heat Wave Survival Checklist

Before the Season:

- Inspect and clean all cooling tower basins and strainers.
- Verify chiller sequencing and staging logic.
- Test all BAS overrides and manual control capabilities.
- Confirm supplemental cooling inventory and vendor contact lists.

During Peak Days:

- Pre-start all necessary equipment before peak demand hours.
- Adjust setpoints in vacant or low-traffic areas.
- Monitor BAS alarms and trend logs hourly.
- Keep constant communication with management and tenants.

After the Event:

- Review performance data.
- Document what worked and what didn't.
- Schedule follow-up maintenance for any stressed components.

Final Thoughts: Plan Like It's Always 105°F

The week of relentless triple-digit heat proved something Jeff already suspected: Success isn't luck — it's preparation, teamwork, and the willingness to adapt in real time.

"It's rare that your first attempt at something is the best you can do," Jeff says. "We're fortunate to have the freedom to try, learn and improve."

For Chicago's Chief Engineers, the takeaway is simple: Prepare as if every July will bring a heat wave. Because one day soon, it will.

Jeff Edeus is Chief Operating Engineer of 875 North Michigan Avenue. A proud member of Local 399 Operating Engineers for over two decades, he has also been a long-time member of the Chief Engineers Association of Chicagoland. Known for his calm leadership under pressure, Jeff continues to mentor younger engineers and share strategies that keep Chicago's skyline cool — no matter how hot it gets.

Michael A. Badame is a journalist and technical writer covering engineering, facilities management, and smart building technologies.

Jack O'Rourke and Jeff Edeus together at a previous CEAC Golf Outing.

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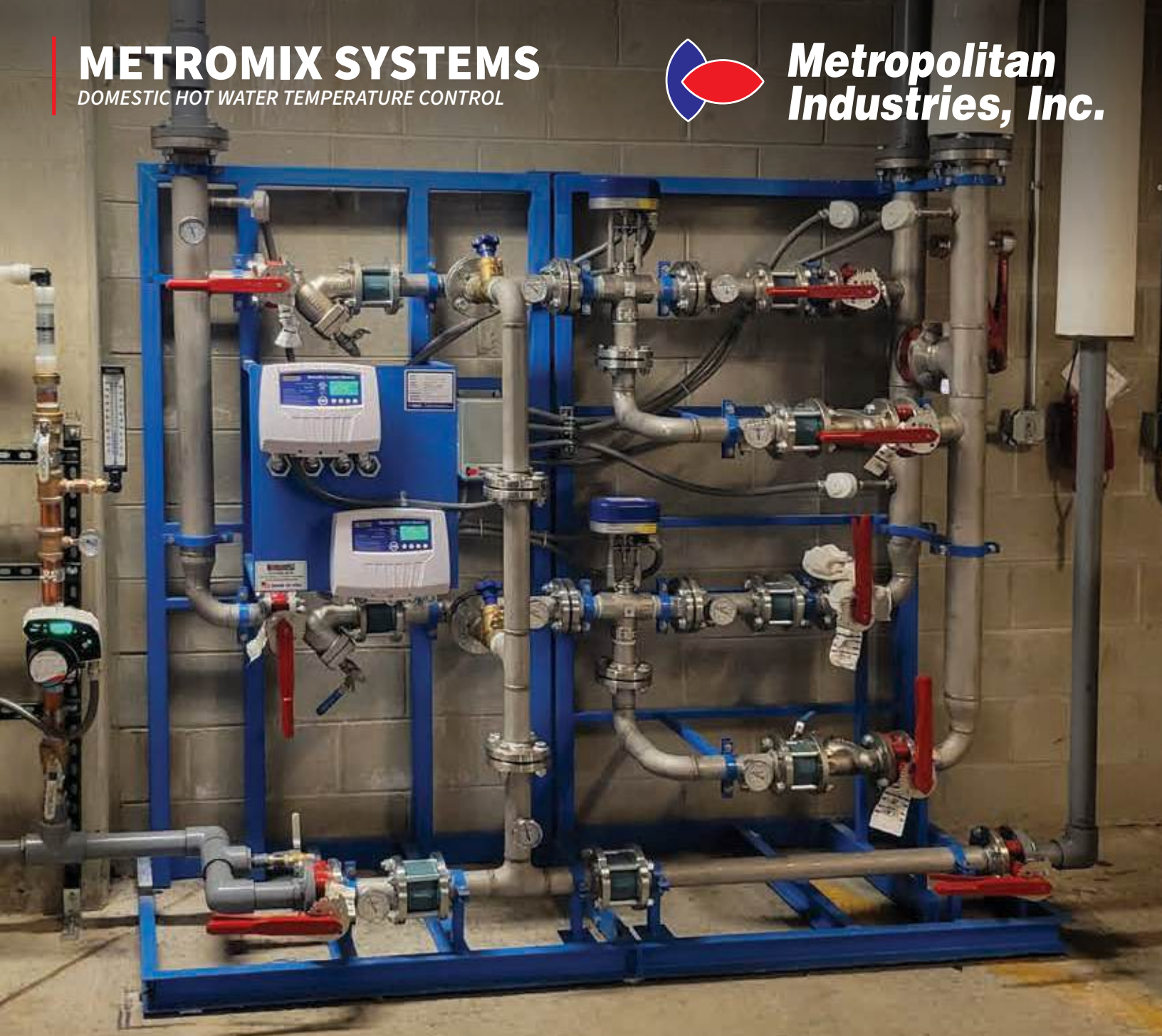

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Gazing at America's First Planetarium

By Kate Gawlik

Maintaining the 95-year-old Adler Planetarium brings unique challenges.

Scientific exploration of the sky has been happening at Chicago's Adler Planetarium since 1930. Noted to be the first planetarium in the Western hemisphere, visitors rely on the Adler Planetarium as their source for astronomy and astrophysics.

Maintaining the historic, 95-year-old building does not come without its challenges or daily adventures.

Michael Coffman, Chief Engineer of the Adler Planetarium, says, "A typical day at the Adler does not really happen. Due to the age of our facility and our location, you never know what you'll be dealing with, from rebuilding original air handler components from the 1930s to rescuing baby ducks out of a sewage tank."

Maintaining a Historic Landmark

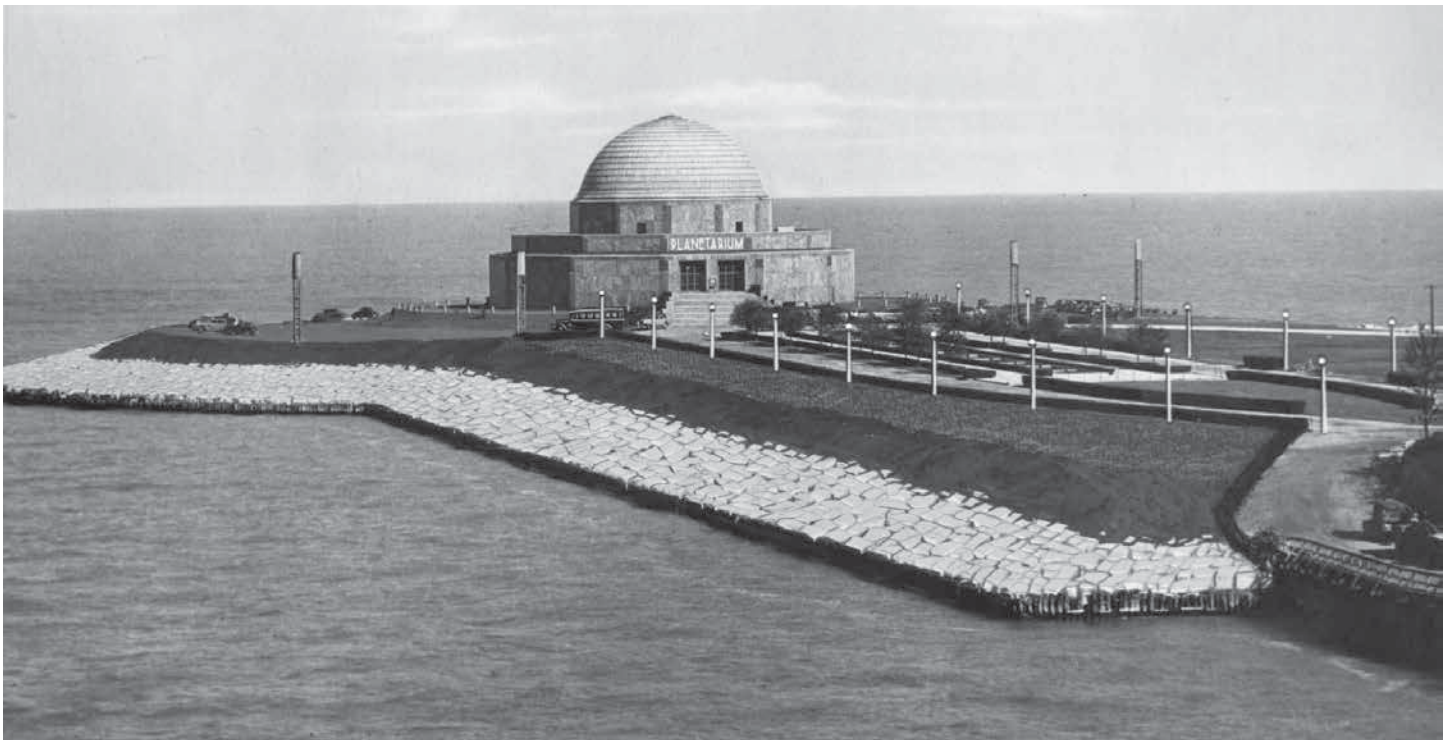
The engineering staff at the planetarium are called upon to maintain a historic site; the Adler was declared a National Historic Landmark in 1987. The team includes Coffman with: Alex Mendoza, Lead Engineer; Dennis Hoskin, Engineer; Brendan Nolan, part-time Engineer, Chris Allen, part-time Engineer; and Josh Carey, part-time Engineer. The crew operates daily from 6:00am to 6:00pm, relying on part-time staff to provide coverage for night and weekend events that are common at the facility. The planetarium can be rented for weddings, as well as for corporate and other events, after regular business hours.

Working in a museum means the engineers are responsible for the health and safety of the staff and everyone who visits on a daily basis. The planetarium hosts about half a million visitors annually in the 60,000-square-foot space.

The site has three theaters — the Space Theater, Grainger Sky Theater and Johnson Theater. The domed theaters wrap viewers in immersive visualization experiences that explain the science behind the cosmos. For the engineering team, this requires maintaining three separate cooling systems to cool the theaters' equipment. The theaters are supplemented with several Liebert units to control server room temperatures, and multiple mini-split systems are used to cool down the projectors.

The main cooling plant consists of one 230-ton York millennium screw R22 and one 430-ton carrier 19XRV centrifugal R-134a, which utilize a BAC closed-circuit cooling tower. Each chiller and cooling tower is open, cleaned and inspected semi-annually by the engineering team. The most recent upgrades include an auto-monitoring chemical feed system to maintain proper water chemistry and a ceramic epoxy polymer coating, supplied by ENECON, installed on the chiller tube sheets and heads.

During off hours, every event comes with its own unique set of challenges for the crew.



The Adler Planetarium — the first planetarium in the Western Hemisphere — opened in Chicago May 12, 1930.

The Chicago skyline visible from the Adler Planetarium is one of the city's most memorable views.

Michael Coffman has been a Local 399 member for 20 years and was inspired to join because of his father, Howard Coffman, a retired 399 member.

"I joined IUOE Local 399 in 2005. I served in the U.S. Navy as a boiler technician from 2000-04, which served as my 399 apprenticeship, allowing me to take my license exam immediately after discharge.

"My main inspiration to join 399 and make it my career was my father, Howard Coffman, a retired 399 member. I grew up witnessing the lifestyle and stability a career with IUOE 399 offers to all its members and their families.

"This isn't just a museum to us. It is a space for all to come together and explore our amazing universe."

"Throughout my career, I've worked at a variety of facilities across the state. Some highlights are at Exelon Nuclear, where I was the Lead Engineer and Roving Engineer for all five nuclear power facilities in Illinois. I have worked at a high-end student housing building in the West Loop, and I spent four years with the U.S. Army Corps of Engineers operating a DC pulsing station on the Cal-Sag Channel to prevent Asian carp from entering Lake Michigan. I also served as the maintenance director for a group of private schools throughout the South Side of Chicago before coming to the Adler. I have been with the Adler Planetarium for almost three years and currently am Chief Engineer.

"I am a fairly new member of the Chief Engineers Association of Chicagoland, and I look forward to increasing my involvement with the organization.

"The largest difference I have recognized in this job compared to others is the people who choose to work here. It is almost like people have a calling to get involved with this institution and are truly passionate about what they do. This isn't just a museum to us. It is a space for all to come together and explore our amazing universe."

Coffman says, "All of our special events require different power needs, and we have the ability to provide whatever is required from lighting to full-blown concerts. We work through an event from setting up the lighting to coordinating vendors for load in and load out. The entire place is transformed from a public museum to a high-end private event. This is normally done within two hours. It truly is a site to see."

The Adler Planetarium is more than a museum because it employs researchers who are dedicated to their craft and contribute new findings. The large Research and Collections department requires very stringent temperature and humidity controls for its research. The monitoring system consists of a Metasys Building Automation System for live monitoring. With it, Coffman and the team are capable of setting individual parameters to meet the researchers' needs. The engineers are alerted via email when equipment or the space's temperature or humidity are out of range. All the data is logged and trends are viewed daily to ensure optimal performance.

The largest publicly accessible telescope in the Chicago area is housed in the Doane Observatory at the Adler. According to the museum, the telescope gathers more than 7,000 times more light than the unaided human eye. This means that celestial objects that are trillions of miles away can be seen with the telescope, which was installed in 2020. The telescope swivel to take in all this viewing is possible in part because of the domed, rotating roof. The roof assembly consists of three 240-volt motors that rotate rubber pneumatic wheels to allow for

Alex Mendoza performs the annual boiler tube cleaning of the planetarium's Cleaver-Brooks firetube 250 hp. 2.

Michael Coffman installs a Cleaver-Brooks Hawkeye control system for the no. 1 250 hp boiler.

360-degree roof rotation. Tire pressure and rotating elements are inspected and maintained monthly.

Coffman adds, "A rotating roof requires a new set of skills not seen much in our industry."

As part of the engineers' duties, the building regularly is assessed for retrofits. Recent upgrades include:

- Performing a lighting switchover to LED
- Improving the electrical distribution system throughout the facility
- Converting domestic hot water from natural gas to electric
- Replacing original jack and screw controls to electronic controls to increase boiler efficiency
- Systematically phasing out antiquated pneumatic controls and replacing them with DDC to increase efficiency and space comfort throughout the facility
- Modernizing the elevators to bring them up to code

A major change that happened about three years ago was bringing much of the repair work in house instead of contracting with outside companies. Coffman worked directly with his supervisor, Leslie Lehman, Director of Operations and Public Safety at the Adler Planetarium, to implement an electronic preventative maintenance and asset tracking system.

"We now perform maintenance and repairs in house to avoid excessive contractor costs," Coffman explains. "Small amounts of attention paid daily result in much less emergency downtime later."

(L to R) Michael Coffman, Chris Allen, Josh Carey, Dennis Hoskins and Alex Mendoza in the Other Worlds exhibit at the Adler Planetarium.

Looking to the Future

As the planetarium nears its 100th anniversary, a new CEO is about to take the helm. Elizabeth C. Babcock, a veteran leader in museums across the country — most recently, the Smithsonian — will join the Adler in October.

The engineering team knows its work will continue alongside the museum's staff to ensure building operational excellence while also strengthening the future of the Chief Engineers Association of Chicagoland.

"What has me excited about our future at the Adler and our field in general is our continued path to sustainability," Coffman says. "Being a private entity and non-profit, our goal has been to minimize costs as much as possible, and reducing our utility reliance is key. We are in discussions to utilize lake water cooling to eliminate our cooling towers and allow us to economize our chilled water loop, minimizing the use of the mechanical cooling entirely. We are currently looking to hire an apprentice due to the wide range of equipment at our facility. This will be a great place to train and mold future engineers."

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

The Adler Planetarium's main chiller plant.

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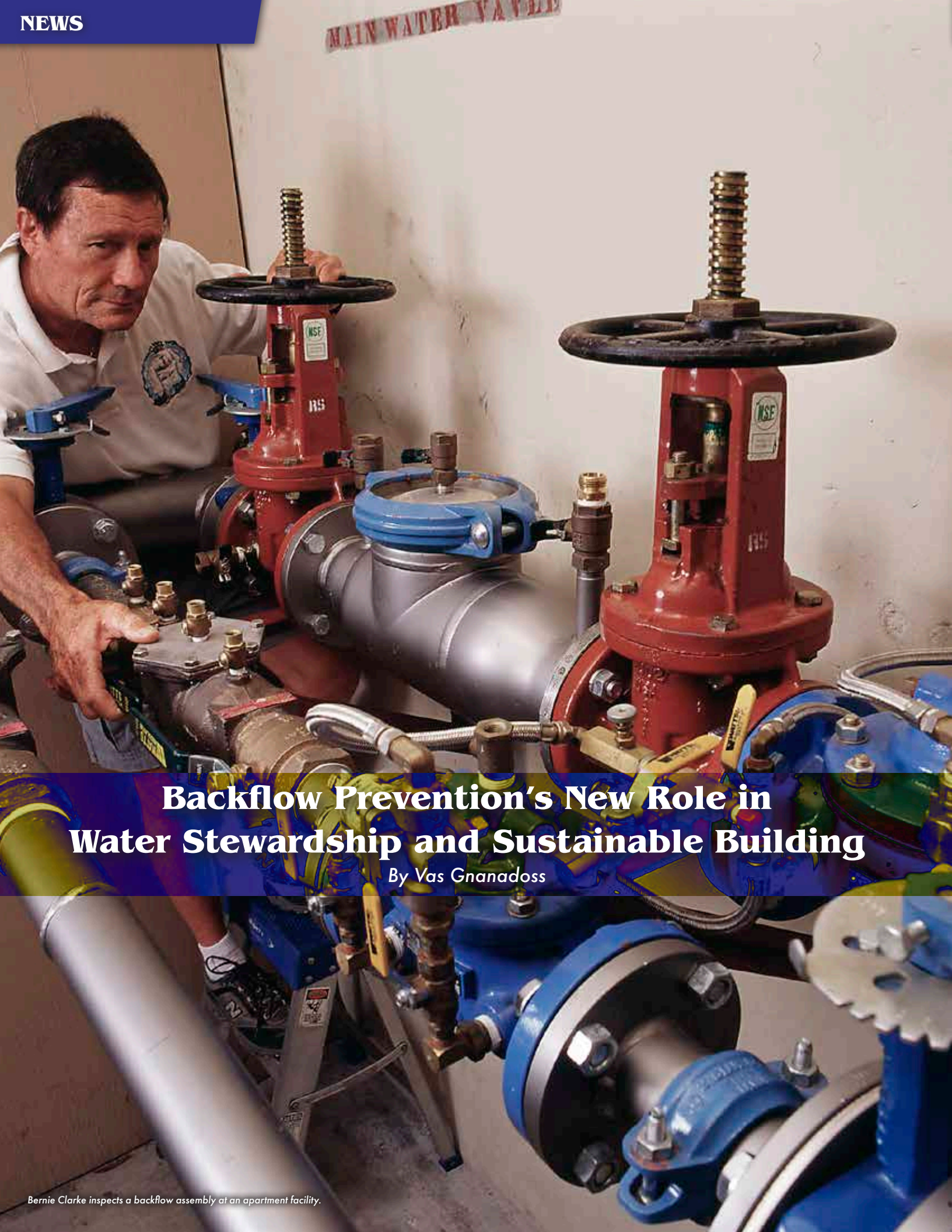
Backflow Prevention's New Role in Water Stewardship and Sustainable Building

By Vas Gnanadoss



Bernie Clarke inspects a backflow assembly at an apartment facility.

In an era where sustainability is shaping nearly every facet of construction and infrastructure planning, water systems are no exception. Across the country, contractors, engineers and facility managers are being asked to deliver more than just code compliance — they're being challenged to future-proof buildings for climate resilience, resource conservation and operational efficiency.

While some innovations grab headlines — like rainwater harvesting or greywater reuse — one unsung hero is stepping into the sustainability spotlight: backflow prevention.

Viewed chiefly as a safety mechanism, backflow preventers have long played a critical role in protecting potable water supplies from contamination. Whether in high-rise buildings, schools, industrial plants, or residential complexes, these devices ensure that contaminated or pressurized water doesn't flow backward into the clean water supply — especially in systems that include irrigation, chemical processing, or fire suppression. But today, backflow prevention is becoming part of a larger story, one that links health and safety with environmental stewardship.

Preventing Waste, Protecting Infrastructure

At its core, backflow prevention is about keeping water safe. But increasingly, it's also about preventing waste.

In the event of a backflow incident, typical remediation protocols involve flushing water systems — a process that can waste thousands of gallons. For buildings in water-stressed regions or under sustainability mandates, that's not just inefficient — it's unacceptable.

Water loss from preventable incidents is a hidden but significant contributor to operational inefficiency. Contractors and facility managers are starting to see backflow prevention as a proactive tool in water conservation strategies.

When there's no risk of freezing temperatures, new backflow assemblies are typically installed outdoors, often protected by fencing and/or locked containers.

Preassembly of components, above ground, for a large backflow assembly, to be fully constructed in a bunker underground.

Smart backflow devices now include sensors and connectivity features that provide real-time data on pressure changes, flow rates, and even temperature anomalies — enabling early intervention before a full-scale event occurs. This shift toward intelligent monitoring is helping building teams to reduce downtime, avoid water damage, and optimize system performance.

Connected Systems for Smarter Sustainability

The move toward digitization in plumbing and mechanical systems is a broader trend shaping the future of commercial and industrial facilities. Smart backflow preventers can now be integrated into building management systems (BMS), providing facility teams with live diagnostics and alerts. In some cases, these systems go a step further, using analytics to identify usage patterns, leaks or pressure drops that may indicate larger systemic issues.

One example is the Nexa™ platform, launched in 2024 by Watts. The system offers remote metering, leak detection and usage analytics across connected devices. It's designed not only to safeguard systems but to surface opportunities for water reuse or process adjustments — tools that can reduce both consumption and utility costs.

Backflow replacement.

This kind of connectivity is especially impactful in complex buildings such as hospitals, universities and municipal facilities where water systems must operate at high reliability. It's not just about avoiding a plumbing failure; it's about optimizing how we use a finite resource.

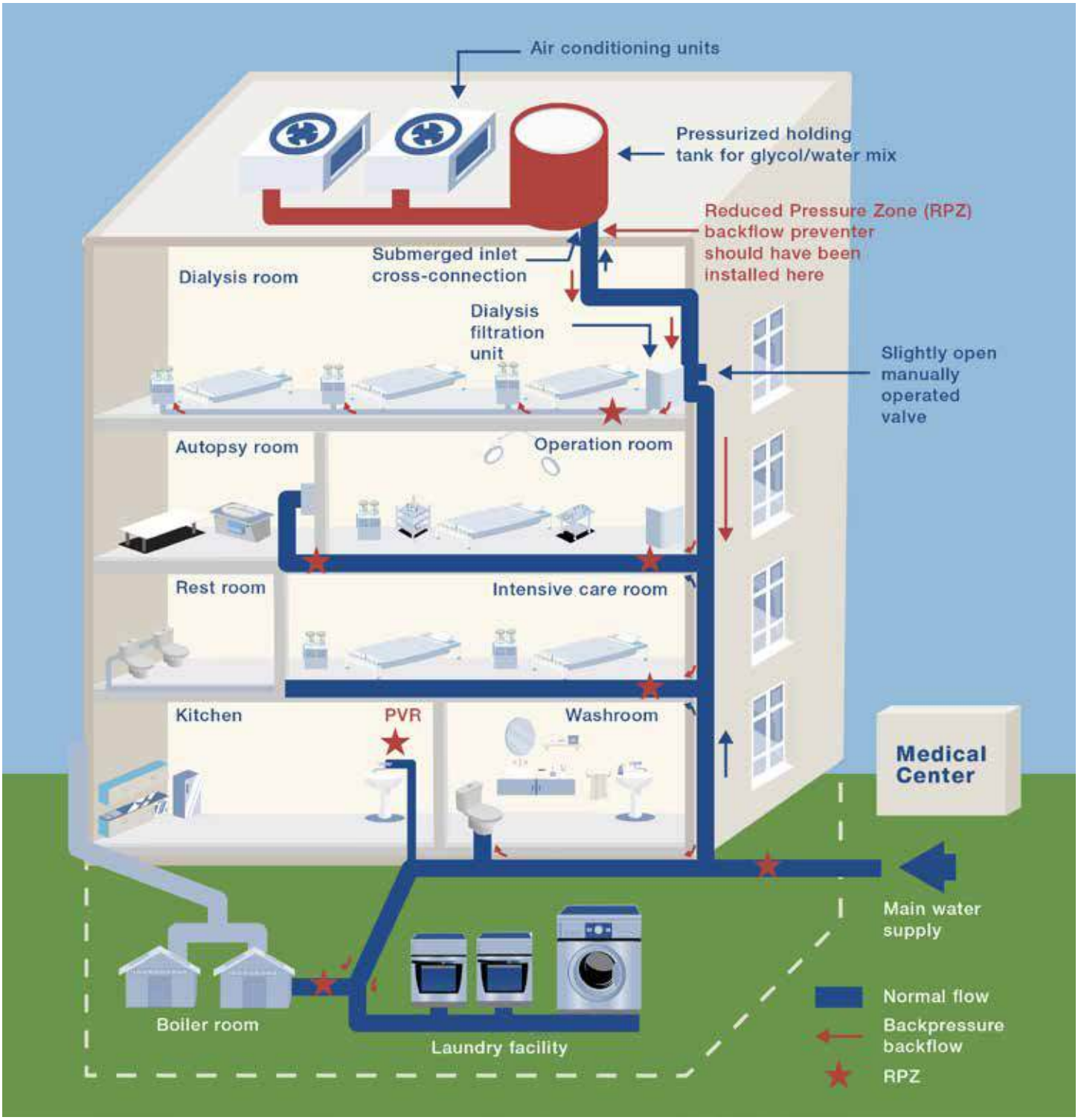
Sustainable Operations From Factory to Field

While contractors are increasingly being asked to install systems with strong sustainability credentials, attention is also turning upstream, to how those systems are made. Product sustainability, lifecycle data and environmental transparency are all under the microscope.

Watts responded by investing in its own operational efficiency. At its Franklin, N.H., manufacturing facility, the company reduced water use by 10 percent in 2024 — more than 650,000 gallons — through real-time monitoring and process changes. Across its global operations, the company has cut water intensity by 62 percent and emissions intensity by 60 percent since 2018.

Importantly, this sustainability isn't being achieved through short-term fixes. Watts reports that more than one million repair kits were sold in 2024, allowing customers to maintain and extend the life of installed systems rather than replacing them. That's a nod to circularity — reducing material consumption

Commercial backflow devices protect public water supplies from contamination by preventing water from flowing backward from building into the municipal water main. Backflow assemblies act as a one-way valve, ensuring that water flows only in the correct direction, safeguarding public health by stopping harmful substances like chemicals, soaps, or industrial waste from mixing with clean, potable water.



This illustration of a medical facility offers insight into the internal workings and placement of a backflow preventer within a building's plumbing system, helping to demonstrate how backflow devices keep contaminated water from reversing and entering the public drinking water supply. Shown is the location of where a Reduced Pressure Zone (RPZ) backflow preventer — the most reliable type (with two independently acting check valves separated by a reduced pressure zone) — should have been installed. Water should flow in one direction, from the municipal supply into the building network of pipes. The illustration shows how check valves and relief valves work in tandem to prevent reverse flow.

and embedded emissions while giving contractors tools to meet longevity goals for their clients.

Verified Progress, Not Just Promises

Environmental claims are increasingly scrutinized in today's construction marketplace. Product data, third-party certifications and lifecycle documentation are becoming prerequisites for specifiers and engineers who want to build sustainably and transparently.

Watts has conducted lifecycle assessments (LCA) on 100 percent of the products manufactured at its largest facility and is on track to publish 50 Environmental Product Declarations (EPDs) by 2026. These resources allow contractors and engineers to evaluate environmental impacts like water use, energy intensity, and emissions over a product's lifecycle.

The company also earned — and renewed — WAVE verification from The Water Council, a recognition of comprehensive water

Backflow replacement.

stewardship planning and risk reduction across its operations. The program assessed seven facilities that together account for 75 percent of the company's total water usage, prioritizing each for strategic reductions.

Looking Ahead: Performance and Sustainability Converge

What's this mean for the contractor in the field? For one, it highlights the evolving role of mechanical systems in sustainable building design. Products that were once installed for compliance are now being leveraged for performance — not only in protecting health, but in saving resources and supporting larger ESG (environmental, social, governance) goals.

Annual testing is an important part of maintaining the performance of backflow assemblies.

It also underscores the growing expectation that building technologies — even in "hidden" areas like backflow prevention — need to be smart, efficient and verifiably sustainable.

In 2024, 42 percent of Watts' global revenue came from clean-tech products, including smart backflow preventers and energy-efficient valves. As demand grows for greener infrastructure and resilient water systems, these solutions are likely to become standard practice — not specialty offerings.

For contractors, that's both a challenge and an opportunity: a challenge to stay current with emerging technology, and an opportunity to lead projects that perform better, cost less over time, and leave a lighter environmental footprint.

On the Ground: What Contractors Need to Know

While high-level goals like water stewardship and emissions reduction may sound abstract, they're having a real impact on what gets specified, installed and maintained in the field. Contractors are increasingly asked to support sustainability outcomes — whether through low-impact product selection, system efficiency or smart monitoring capabilities.

Backflow prevention is a clear example. Once a simple compliance measure, it's now a multifaceted tool: protecting potable water, reducing waste, and enabling smarter system management. Devices that offer real-time diagnostics, remote alerts, and lifecycle transparency are becoming more than value-adds — they're becoming expectations.

Demand for repairability, material conservation and documented sustainability is growing in both public and private construction. Contractors who understand how to source, install and service technologies that meet these demands will be better positioned to win projects — especially those with green building requirements or ESG benchmarks.

Ultimately, as smart water infrastructure becomes the new standard, performance and sustainability are converging. For today's contractor, staying competitive means staying informed — not just about products, but about how they fit into a larger, more resilient water future.

Vas Gnanadoss is Product Sustainability Engineer at Watts Water Technologies.

Taco's HS Series pumps feature heavy-duty cast and ductile iron casing to ensure durability and long life, making them ideal for demanding environments.

Taco HS Series Horizontal Split Case Pumps — Engineered for Performance, Built for Longevity

Taco has recently introduced its HS Series Horizontal Split Case Pumps — engineered for superior efficiency, durability, and ease of maintenance. Designed to maximize power savings while minimizing operating costs, these pumps are ideal for commercial and industrial applications requiring reliable, high-performance solutions.

The HS Series features a short shaft design, extending the pump's operational life and reducing maintenance requirements. Its heavy-duty cast and ductile iron casing ensures exceptional strength and longevity, making it an ideal choice for demanding environments. The pump's extra-heavy construction enhances durability, providing long-lasting performance in even the most rigorous applications.

Taco has also prioritized serviceability. HS Series pumps are built with a mechanical seal and bearings that are easily accessed without disturbing the top casing, making maintenance fast and hassle-free. This design innovation minimizes downtime and reduces labor costs.

Each pump in the HS Series comes equipped with Taco Tags, a cutting-edge QR code technology that provides instant access to essential product information, including specifications, installation guides, and troubleshooting resources—all available at the tap of your smartphone. It's all part of Taco's commitment to making your life easier by giving you the tools you need to keep things running smoothly.

With the HS Series, Taco has combined high efficiency, ease of service, and superior durability into one powerful package. The pumps not only deliver exceptional performance, but also ensure that maintenance is as straightforward as possible, helping customers save time and costs.

For more information, visit www.tacoinc.com

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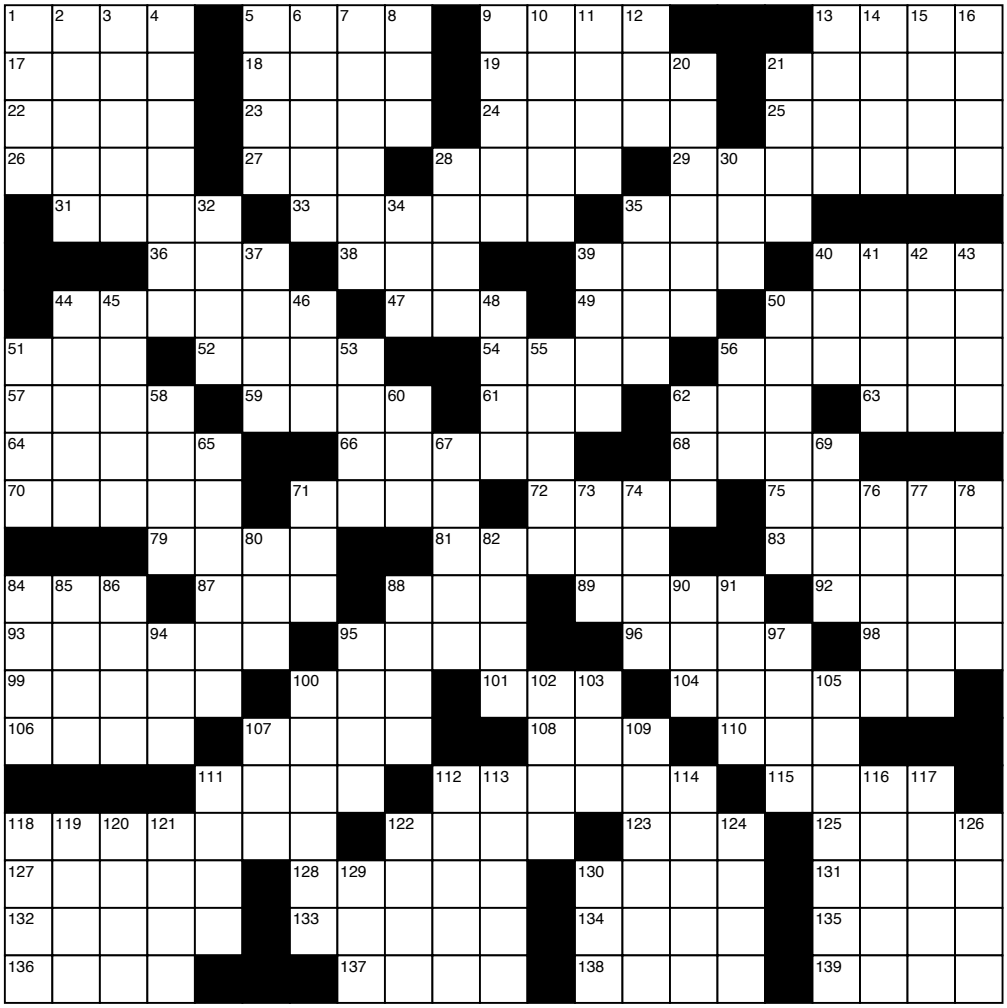
For more information or to purchase the VAV14-IP, visit tinyurl.com/yc6652ah



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1 __ and span
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17 Business note
18 Alack's partner
19 Do penitence
21 Lure
22 Voiced
23 Hind end
24 Played a movie
25 Arouse
26 __ girl
27 Short-term memory
28 Quicken
29 Determines the meaning of
31 Burial chamber
33 Gentle wind
35 Tariff
36 Transport
38 Couple
39 Halo
40 American Association of Retired Persons (abbr.)
44 Solidified
47 Catch some Z's
49 Stretch to make do
50 Widely known
51 Pod vegetable
52 Asian humped ox
54 Healing plant
56 Practical jokes
57 Rodents
59 Tableland
61 Licked
62 Central daylight time
63 ___ up
64 Swimming mammal
66 Tibias
68 Winnie the __
70 Outguess
71 Nail
72 Bunsen burner
75 Organized crime
79 Misprint
81 Store passageway
83 Hallowed
84 Reduced (abbr.)
87 Hint
88 Doctoral degree
89 Barrow
92 Order
93 Well lit
95 Bowed stringed instrument
96 Defeat
98 Can
99 Body cavity
100 Driving hazard
101 Flightless bird
104 Woeful
106 Played in the water
107 Lubricates
108 Incorporated (abbr.)
110 Relation
111 Skin sore
112 Cola brand
115 Enjoy
118 From Kuwait
122 Italian currency
123 Official
125 Alcoholic beverage from honey
127 Heavy-handed
128 Hum
130 Uproar
131 Not out of
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133 Looked at fondly
134 Teen disease
135 Canal name
136 Solitary
137 Corn syrup brand
138 Wham
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DOWN

1 Air pollution
2 Ross ___, philanthropist
3 Adult insect
4 Capital of Sri Lanka
5 Boat movers
6 Oaf
7 Jammed
8 Viper
9 Pallid
10 Remaining one
11 Dig
12 North northwest
13 Israel's son
14 Economics abrv.
15 Came out of sleep
16 Colors
20 Last
21 Resist
28 Hold it there
30 Terminal abbr.
32 Drones
34 Play on words
35 Earl
37 Look
39 Long time
40 Parody
41 First letter of the Arabic alphabet
42 Speed
43 Posttraumatic stress disorder
44 Heroic actions
45 Shabby
46 Compass point
48 Chess piece
50 Inter
51 Support
53 Soviet Union
55 Doesn't win
56 Flurry
58 Cult
60 Expression of surprise
62 Accountant
65 Pattern
67 Potato state
69 50%
71 Jazz
73 Tender loving care
74 Approach
76 Italian physicist
77 Abraham's son
78 Lawyer (abbr.)
80 Cavity
82 Lazy
84 The alphabet
85 Witch's concoction
86 Costa __
88 Oink animals
90 Deteriorate
91 Turkish denizen
94 Sticky stuff
95 Electrical current unit
97 Back of a coin
100 Using a gun
102 Transparent substance
103 Spanish "one"
105 Dwarfish
107 Grain
109 Clasp
111 Along
112 Bleacher
113 Creed
114 Type of acid
116 Locale
117 Devourer
118 Buss
119 Preposition
120 Wale
121 Church part
122 Ms. Minelli
124 Preparation (abbr.)
126 Drowse
129 Furniture wood
130 Beheld

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Solution:

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■	■	■	■	W	A	G	■	E	G	G	O	S	■	H	E	W	■	■	■	■
■	F	U	T	O	N	■	R	A	I	L	■	T	H	E	I	L	I	A	D	■
B	A	S	E	■	A	D	S	■	R	E	M	■	Y	I	N	■	D	E	A	R
A	G	U	E	■	■	E	V	I	L	■	A	R	M	S	■	■	O	G	R	E
N	O	R	M	■	A	L	P	O	■	G	I	A	N	T	S	■	L	I	E	S
S	T	Y	■	A	S	L	■	U	P	E	N	D	■	S	I	S	■	S	S	T
■	■	■	A	R	K	■	■	■	I	L	L	■	■	■	X	I	I	■	■	■
P	U	R	I	M	■	R	I	T	Z	■	A	R	I	A	■	R	O	Y	A	L
E	M	U	S	■	N	O	D	O	Z	■	N	O	N	C	E	■	T	U	N	A
A	B	E	L	■	O	P	E	R	A	■	D	A	T	E	S	■	A	L	T	O
R	O	D	E	■	N	E	A	T	■	■	■	R	O	S	E	■	S	E	E	S

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