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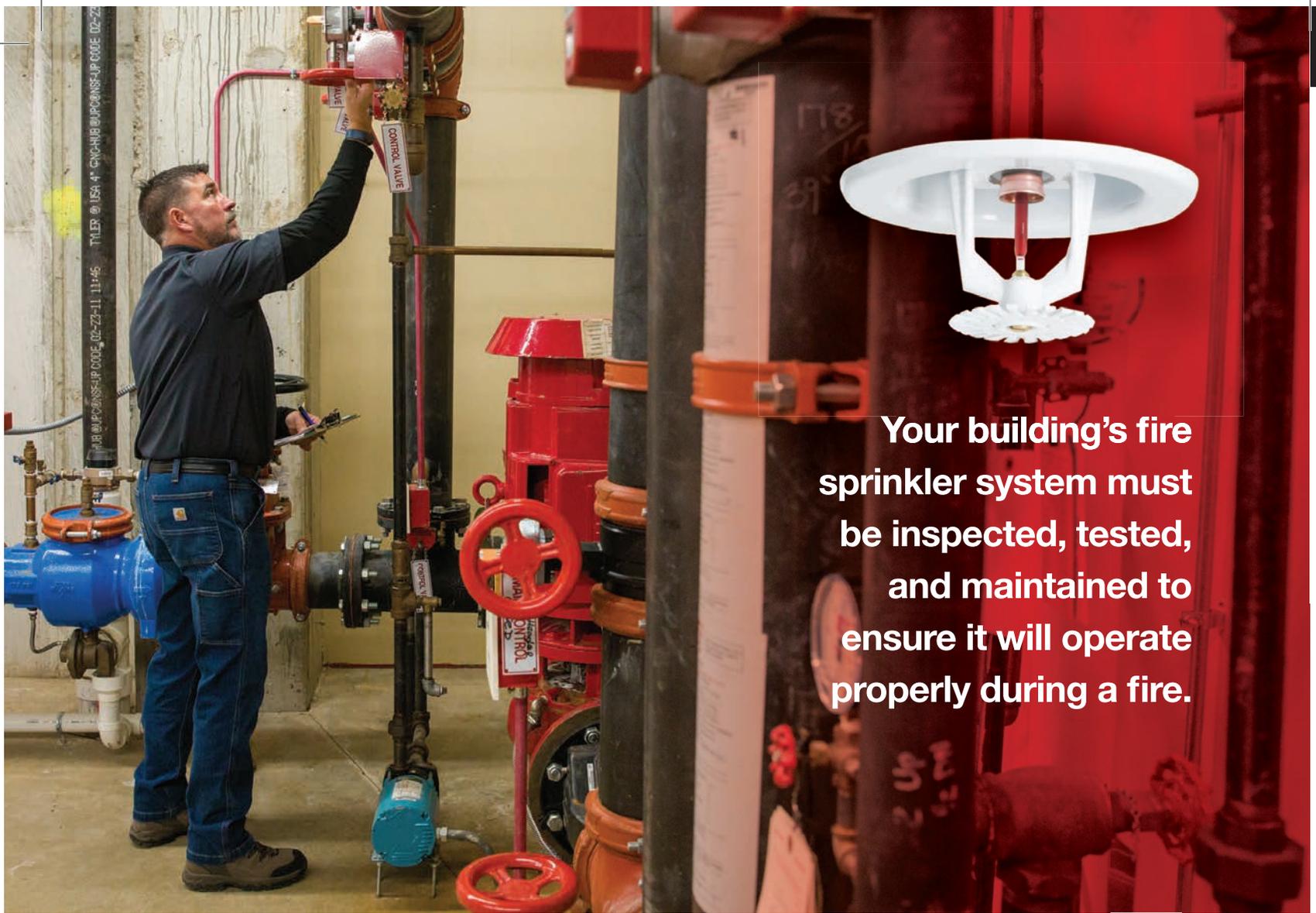
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The Chief Engineers Association of Chicagoland

NOVEMBER MEETING

Come network at the CEAC November General Meeting! This is an election month for the board so we will be asking Active members to confirm their vote for the current board slate. We hope to see you there!

Parking Lot to the west of Bottom Lounge, while spots are available. Otherwise, street parking or use Spot Hero.

NOV 16

5PM - 8PM

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PRESIDENT'S MESSAGE



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Dear Members,

It was great to see everyone at the Oktoberfest event at Bridge 410, and great to start our new year of meetings in a new place. Our Oktoberfest meeting is always one of the most popular of the year, and it was nice to see that hasn't changed, even if the location did. As always, we are grateful to everyone who had a hand in making it happen, especially our Board members, our event planner, Alex Boerner, and everyone over at Bridge 410 for making the night such a memorable and successful event.



Next month's meeting will be held Wednesday, Nov. 16, at The Bottom Lounge at 1375 W. Lake St., Chicago. Since this is an election month for the Board, we're asking Active Members to confirm their votes for the current board slate, and hope to see as many of you there as possible.

We also have advance notice on the December meeting, which will take place Wednesday, Dec. 14, at Maggiano's, 516 N. Clark St. downtown. We usually select a charity to donate to for our December meeting, and we will be doing so this year, but we're still discussing what charity that will be. We should be able to announce that soon enough.

As it often does, the weather took a quick turn for the colder this fall. I'm sure all of you have attended to your heating systems in anticipation of the cold season ahead, but I'll just remind everyone to make sure that your buildings and all the equipment are ready to take on Old Man Winter.

If any unforeseen issues happen and you need outside help, remember to consult your Quick Shopper. Our Associate Members are incredibly supportive of us, the Chief Engineers Association, and we like to be equally supportive of them. They're the best available out there, so don't hesitate to reach out and give them your business.

Lastly, with the holidays arriving later in the month, I would like to wish all of you and your families a happy Thanksgiving. I also would suggest that we take a moment to remember our men and women in the military who sacrifice so much for our freedom — especially those who are posted far from home, where they would rather be — as well as the first responders in our communities for all they do to protect us and keep us safe.

I look forward to seeing all of you at the November meeting.

Sincerely,

Ken Botta

IN BRIEF

Puerto Rico to Probe Power Bill Complaints Following Outage

SAN JUAN, Puerto Rico (AP) — Puerto Rico's Energy Bureau announced Thursday, Oct. 13, that it will investigate how a private company has handled complaints about electric bills after Hurricane Fiona knocked power out to the entire island.

The announcement comes as a growing number of customers in the U.S. territory complain about being charged for electricity when they didn't have power and receiving higher than normal power bills.

The Independent Office of Consumer Protection urged the bureau to investigate difficulties in filing such complaints.

The bureau called on Luma Energy to immediately stop any practice that prevents consumers from objecting to bills via telephone or online, and to extend the deadline for clients to file their complaints, among other things.

It also demanded that Luma Energy submit evidence within 10 days that it was complying with the bureau's orders.

Ohio Offers \$156M in Incentives for Honda Battery Plant

COLUMBUS, Ohio (AP) — Ohio plans to offer approximately \$156.3 million in tax incentives and infrastructure improvements for a massive battery plant project that Honda says is key to turning the state into its North American electric vehicle hub.

Officials say the battery plant, to be built jointly with LG Energy Solution of South Korea, will be located in rural Fayette County, about 40 miles southwest of the state capital of Columbus.

Of \$85 million set aside for infrastructure improvements, \$75 million will be for water and utility improvements and the rest will be to improve local and state roads, state officials said Wednesday, Oct. 12.

The remainder will go towards tax incentives over a 30-year period, according to state officials. However, local tax incentives are not included in this incentives package.

In a recent announcement, Honda said it will build a \$3.5 billion joint-venture battery factory in rural southern Ohio and hire 2,200 people to staff it.

Honda also announced its plans to invest \$700 million and add 300 jobs at three of its own Ohio factories to prepare them to start making EVs and components.

The battery plant could see a total investment of \$4.4 billion, officials said.

Louisiana Moves Closer Toward Large Carbon-Capture Project

BATON ROUGE (AP) — Three energy corporations are partnering on a carbon-capture project with the hopes of dramatically reducing industrial carbon dioxide emissions in Louisiana, Gov. John Bel Edwards announced Wednesday, Oct. 12.

ExxonMobil, CF Industries and EnLink Midstream have entered into an agreement with the aim to move 2 million metric tons of carbon dioxide annually — equivalent to what would be produced by nearly 431,000 gas-powered cars driven for one year, according to the Environmental Protection Agency — by capturing carbon emissions and storing them deep underground.

"This landmark project represents large-scale, real-world progress on the journey to decarbonize the global economy," said Dan Ammann, president of ExxonMobil Low Carbon Solutions.

Captured emissions from the CF Industries ammonia production plant in Donaldsonville — the top greenhouse gas industrial emitter in the state, based on Louisiana's 2021 Greenhouse Gas Inventory report — will be transported through EnLink's existing pipeline network and "injected into deep, underground geologic formations" on ExxonMobil property in Vermillion Parish. Officials estimate the startup date to be in 2025.

Idaho Resumes Radioactive Waste Shipments to New Mexico

BOISE, Idaho (AP) — Shipments of nuclear waste from the U.S. Department of Energy's site in eastern Idaho to a nuclear waste repository in New Mexico have resumed following three episodes that caused New Mexico officials to suspend them.

An Energy Department official told Idaho officials Wednesday, Oct. 12, that the New Mexico Environment Department the previous week gave the OK for shipments from the 890-square-mile site that includes the Idaho National Laboratory to resume to the department's Waste Isolation Pilot Plant near Carlsbad.

The New Mexico agency suspended the shipments Sept. 14 following problems with three shipments. Officials said a drum leaking liquid in April caused a partial evacuation at the plant, but no contamination was reported. That was followed in July by another drum with a corrosion-like

substance that escaped from the bottom, and in August by a shipment that appeared to have droplets on top.

Connie Flohr, manager of the Idaho Cleanup Project for the Energy Department's Office of Environmental Management, told Idaho officials during a Leadership in Nuclear Energy Commission meeting that additional steps are being taken to make sure the shipments don't leak or rupture.

Idaho Nuclear Waste Treatment Plant Could Start in December

BOISE, Idaho (AP) — A nuclear waste treatment plant in eastern Idaho designed to treat 900,000 gallons of sodium-bearing, radioactive waste that has had numerous setbacks will likely start operating in early December, a U.S. Department of Energy official recently said.

Connie Flohr, manager of the Idaho Cleanup Project for the Energy Department's Office of Environmental Management, told Idaho officials that the Integrated Waste Treatment Unit at the department's 890-square-mile site that includes the Idaho National Laboratory has successfully completed test runs with a simulant material.

"We have every confidence that we will be operating in December," she told members of the Leadership in Nuclear Energy Commission during an online meeting.

The commission makes recommendations to the governor regarding policies to support the viability and mission of the Idaho National Laboratory and other nuclear industries in the state. Commission members, appointed by the governor, include state lawmakers, local government elected officials, university officials and others.

Utilities Commission Says CO2 Pipeline Fee Could Be \$400,000

SIOUX FALLS, S.D. (AP) — South Dakota's Public Utilities Commission recently authorized its staff to begin reviewing an application for a pipeline designed to transport carbon dioxide from ethanol refineries to an underground site in Illinois, assessing a filing fee of up to \$400,000.

The pipeline is the second proposed in the state. Both projects would pump carbon dioxide to sequestration sites where it would be buried thousands of feet underground. The one before the Public Utilities Commission — proposed by Navigator CO2 — would connect ethanol refineries across the Great Plains to a site in Illinois.

The commission's staff found that it could cost over \$270,000 to review Navigator CO2's application, which was submitted in September. Navigator CO2 agreed to covering a filing fee of up to \$400,000.

"It needs to be a quality evaluation and not have that cost

fall back on the taxpayers," said Kristen Edwards, a staff attorney for the commission.

Ex-Michigan Governor Asks Court to Drop Flint Water Charges

DETROIT (AP) — Lawyers for former Michigan Gov. Rick Snyder urged a judge Tuesday, Oct. 11, to dismiss misdemeanor charges related to the Flint water crisis, a week after another judge took that step with seven other former officials.

Snyder wasn't covered by Judge Elizabeth Kelly's decision because she was overseeing felony charges against the seven. But his legal team said the "same law and logic" must be applied, especially after the Michigan Supreme Court said the indictments were invalid.

"This court should reach the same conclusion," attorney Gaetan Gerville-Reache said in a filing.

Snyder was charged with two counts of willful neglect of duty.

In 2014, Flint managers appointed by Snyder took the city out of a regional water system and began using the Flint River to save money while a new pipeline to Lake Huron was being built. But the river water wasn't treated to reduce its corrosive qualities. Lead broke off from old pipes and contaminated the system for more than a year.

Honda, LG to Build \$3.5B Battery Plant, Hire 2,200 in Ohio

COLUMBUS, Ohio (AP) — Honda says it will build a \$3.5 billion joint-venture battery factory in rural southern Ohio and hire 2,200 people to staff it as the company starts to turn the state into its North American electric vehicle hub.

Honda, which announced its first Ohio factory 45 years ago, also plans to invest \$700 million and add 300 jobs at three of its own Ohio factories to prepare them to start making EVs and components.

The battery plant, to be built jointly with LG Energy Solution of South Korea, could see a total investment of \$4.4 billion. The plant site is off Interstate 71 in Fayette County, about 40 miles southwest of the state capital of Columbus.

In addition, Honda's assembly plants in Marysville and East Liberty, northeast of Columbus, and its engine plant in Anna north of Dayton, will share in the \$700 million investment. The Anna plant will make cases to hold the battery cells, while the other two plants will build complete electric vehicles. Construction on the battery plant will start early next year. ■■

NEWS

Radioactive Waste Finding Raises

Worries at Missouri School By Jim Salter | Associated Press

FLORISSANT, Mo. (AP) — Radioactive waste in a creek that meanders through part of suburban St. Louis has long been suspected of causing rare cancers and other health problems for residents who live nearby. Now, new studies suggest Coldwater Creek also has caused contamination around — and perhaps inside — a grade school.

Students are still attending Jana Elementary School in Florissant, Missouri, despite a private company's new report that found radioactive material far above the expected level for the school that sits within Coldwater Creek's flood plain.

Contamination was found in classrooms and the library, in the HVAC system and on the playground and nearby fields, according to a report from Boston Chemical Data Corp. The study completed in October was performed on behalf of law firms involved in a class-action lawsuit — one of many seeking compensation for those who blame illness or death on living near the creek.

The Boston Chemical study cited levels of radioactive isotope lead-210 that were 22 times the expected level on the kindergarten playground. It also found high levels of polonium, radium and other material in various places throughout the school.

The U.S. Centers for Disease Control and Prevention says high levels of radiation can increase the risk of cancer, while high levels of lead can impact a child's development and attention span.

"Remedial measures are appropriate to reduce exposures to radioactive materials for users of the school building and grounds but are complicated by the potential for recontamination due to flooding of the contaminated Coldwater Creek," the report stated.

The private study follows an examination by the Army Corps of Engineers that found radioactive contamination in a field near the school. The Corps study did not examine the playground or the school's interior.

"Safety is always our top priority, and we are actively discussing the implications of the finding," a statement from the district read. "The Board of Education will be consulting with attorneys and experts in this area of testing to determine next steps."

The school — which sits in a subdivision surrounded by homes — opened in the 1970s and has educated thousands of children, said Christen Commuso of the Missouri Coalition for the Environment. While the area along Coldwater Creek is racially mixed, about 80 percent of Jana Elementary

School's 400 students are Black.

"You're talking about kids throughout the decades who have been exposed to this." Commuso said.

Nuclear waste from World War II weapons production as part of the Manhattan Project contaminated Coldwater Creek. Mallinckrodt Chemical Co. processed uranium ore in St. Louis from 1942 to 1957 and shipped waste to a site near Lambert Airport, next to Coldwater Creek.

The contamination was over roughly half of the 19-mile-long creek that flows into the Missouri River. The Environmental Protection Agency designated the creek as a Superfund site in 1989. Remediation efforts — digging up contaminated dirt and taking it by covered rail car to a waste management facility in Idaho — aren't expected to be complete until 2038.

In 2019, the federal Agency for Toxic Substances and Disease Registry issued a report stating that people exposed to the



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This aerial photo shows Jana Elementary School, in the Hazelwood School District, Monday, Oct. 17, 2022, in Florissant, Mo. Elevated levels of radioactive waste were found at the school, according to a recent report, and the parent-teacher association wants an open public meeting to discuss it. Nearby Coldwater Creek, hidden by a line of trees next to the field to the right, which is prone to flooding, was contaminated by waste from nuclear bombs manufactured during World War II. (David Carson/St. Louis Post-Dispatch via AP)

creek from the 1960s to the 1990s may have an increased risk of bone cancer, lung cancer and leukemia.

Dawn Chapman, co-founder of the environmental group Just Moms STL that has pushed for cleanup of Coldwater Creek, acknowledged the difficulty in connecting illnesses to contamination. But Chapman cited several former students at the grade school now battling rare cancers and other illnesses, and former teachers who have had children with life-threatening illnesses.

"Everybody's just terrified," Chapman said.

Phillip Moser, program manager of the Corps of Engineers' Formerly Utilized Sites Remedial Action Program in St. Louis, told the *St. Louis Post-Dispatch* that the Boston Chemical report needs further evaluation.

"I already have questions about the conclusions," Moser said.

Commuso and Chapman were alarmed by what they see as a lack of transparency by the school district. The Corps launched its study four years ago, but Commuso said results only became public after she obtained the report this spring through a Freedom of Information Act request.

Even the school board was uninformed of the results, Commuso said. She presented information on the Corps report to board members in June.

Ashley Bernaugh, president of Jana Elementary's parent-teacher association, said the organization is urging the district to immediately begin cleanup, even if it means relocating kids to another building.

Eventually, Bernaugh said, she wants her son to be back at the school.

"We love Jana Elementary," Bernaugh said. "I'll go down fighting for it." ■■

AP reporter John Hanna in Topeka, Kansas, contributed to this report.

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NEWS

Colorado to Re-use Water for Drinking, Creating New Supply By Brittany Peterson | Associated Press

Castle Rock, Colo. (AP) — When Eric Seufert brewed a test batch of beer in 2017 with water from recycled sewage, he wasn't too concerned about the outcome. The engineering firm that approached him about the test explained the process, and together they sipped samples of recycled water. Seufert quickly understood it wasn't too different from how water is normally handled.

"Every stream and river in this country has someone putting in their wastewater after they've treated it," he said.

After tapping the keg and having a taste, the owner of 105 West Brewing Co. in Castle Rock, Colorado proudly served it at his bar.

Brewing beer, cooking food, and refilling water bottles with recycled wastewater could soon become standard practice in a state that's synonymous with its pristine-tasting snowmelt and mountain springs.

Last week, Colorado's water quality agency gave unanimous preliminary approval to regulate direct potable re-use — the process of treating sewage and sending it directly to taps without first being dispersed in a larger water body. Pending a final vote in November, the state would become the first to adopt direct potable re-use regulations, according to state and federal officials.

"Having well-developed regulations ... helps ensure projects are safe and that project proponents know what will be required of them," said Laura Belanger, water resources engineer with the non-profit Western Resource Advocates.

As the state's population explodes and regional water supplies dwindle, recycling water for drinking is a significant opportunity for stretching a limited supply, said Kevin Reidy, conservation specialist for the Colorado Water Conservation Board. And he said it's a game changer in a place like Castle Rock, a city of 75,000 just south of Denver nestled under its prominent namesake butte, that relies primarily on pumping finite groundwater for drinking.

"I think it's an important tool for the long term because it gives water providers options to respond to future scarcity of water supplies, whether drought-driven or other reasons," said Mark Marlowe, director of Castle Rock Water.

The utility already re-uses about 14 percent of its wastewater, sending it to a creek from the treatment plant, and re-drawing it farther downstream. But as climate change leads to more arid conditions in the western U.S., the creek's flow is becoming less reliable.

With a dry bed, water is "lost" into the ground rather than recaptured and sent back out to taps. Blending highly treated wastewater directly at the facility would eliminate that climate risk, Marlowe said.

The process, which typically entails disinfecting wastewater with ozone gas or ultraviolet light to remove viruses and bacteria, then filtering it through membranes with microscopic pores to remove solids and trace contaminants, is gaining interest as communities grapple with extended droughts. While many U.S. states don't explicitly prohibit this type of water re-use, developing statewide standards can encourage more rapid adoption, said Reidy of the Colorado conservation board.

There are no specific federal regulations for direct potable re-use. However, projects have to comply with federal health standards for drinking water.

Like many Colorado cities, Castle Rock is still evaluating the cost and urgency of adopting direct potable re-use, but plans to begin testing next year so they can be ready to move quickly if needed. Even so, it could be three to five years before the new source is available.

That's actually a short timeline for developing a new water supply, much speedier than building a reservoir over 20 to 30 years, said Reidy. "You're looking at the long-term viewpoint."

The interest is widely shared among other Colorado Front Range cities, many involved in the rule making process. The region anticipates rapid population growth over the next few decades, and treating sewage for drinking is how that growth will be met, said Greg Baker of Aurora Water.

"It becomes more and more difficult to acquire new water,"



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Eric Seufert, owner and manager of 105 West Brewing Co., poses for a photo at his brewery room Tuesday, Oct. 18, 2022, in Castle Rock, Colo. Brewing beer, cooking food, and refilling water bottles with recycled wastewater could soon become standard practice in a state that's synonymous with its pristine-tasting snowmelt and mountain springs. (AP Photo/Brittany Peterson)

Baker said. "The more we can take advantage of water we already have, the better for all of us."

Treated wastewater from local rivers and creeks often must be returned to the source for downstream users, who are owed minimum flows as required by various laws. But imports, such as Colorado River water pumped over the continental divide and down to the Front Range, can in many cases be completely used up.

Nearly all the water in Aurora can be re-used. The city is currently re-using about 10 percent, filtered through the South Platte River bank, and is well-positioned to accommodate future growth by expanding recycling, Baker said.

Florida, California and Arizona are moving swiftly to adopt regulations as well, and a handful of other states are beginning the process or have existing projects. As conditions continue to decline on the Colorado River, Arizona faces deep mandatory water cuts, while pressure mounts for California to give up more of its share — a strong incentive to find ways to stretch what they have.

Denver and Colorado Springs — the state's most populous cities — already recycle the majority of their water through downstream exchanges with other cities and for non-drinking uses, such as watering parks. Both expect to someday recycle water for drinking purposes, but officials are concerned their re-useable supplies from the stressed Colorado River soon could face mandatory reductions.

"If you've built a big direct potable re-use system and you don't have it even for a few years, that causes some problems," said Greg Fisher, demand planning manager at Denver Water.

"If we are relying on those re-useable [drinking water] supplies to meet our customers' needs, our ability to meet their needs is put at risk," Fisher said.

Water recycling projects can carry a large price tag, although federal funding is available. The Environmental Protection

Agency offers low-cost loans for water infrastructure projects, including recycling. Through the U.S. Bureau of Reclamation's water recycling programs, the Bipartisan Infrastructure Law offers over \$1 billion over the next five years for non-federal water recycling projects.

As part of the program, \$20 million was recently granted to El Paso's water board to help construct a direct potable reuse facility. The project is expected to save 13,000 acre-feet of water annually — enough to supply about 26,000 households.

Not all projects will meet requirements for federal assistance, so costs could fall to users. But delaying re-use and relying on new water — if it's available — can be expensive.

"You have to compare it to the cost of new supplies and where you'll store that," Reidy said.

Seufert already knows he can make good beer from recycled water. He's more worried about keeping the cost of business down.

"I'm concerned that the resources will be there for the planned growth in an affordable way for this region," Seufert said. "But, as of now, I trust that they're working on it."

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NEWS

CarbonCure Launches Environmental Product Declaration Service for Concrete Producers

HALIFAX, Nova Scotia (GLOBE NEWSWIRE) — CarbonCure Technologies, the global leader in carbon dioxide removal technologies for the concrete industry, has announced the launch of its environmental product declaration service, CarbonCure Express EPD. An EPD is an independently verified document that quantifies carbon emissions, environmental impacts and other life cycle information of a concrete product, in the same way that nutrition labels report ingredients and calories in food products.

CarbonCure Express EPD leverages real-time concrete plant data to automate and streamline product-specific environmental product declaration (EPD) generation. The new EPD service is CarbonCure's latest offering in its platform of solutions and services for low carbon concrete manufacturing.

A recent industry survey and new policymaking indicate surging demand for EPDs and public and private procurement of sustainable building materials, like concrete.

CarbonCure Express EPD streamlines the complex life cycle assessment (LCA) process required for EPD generation by automating much of the data collection. This enables concrete manufacturers to quickly produce accurate, product-specific EPDs, generated through a secure program and available at an accessible price. With LCA support from objective organizations like Athena Sustainable Materials Institute and final verification from trusted third parties, designers and builders can trust the accuracy of CarbonCure Express EPDs to help them make informed comparisons during procurement.

Express EPD is the latest addition to CarbonCure's platform

of solutions and services — featuring a suite of carbon removal technologies, field-leading software, revenue-boosting carbon credits and now reporting — offered as a subscription package and bolstered by personalized customer support.

“By adopting CarbonCure's portfolio of hardware and software solutions, including our new Express EPD service, making the transition to low carbon concrete has never been easier,” said CarbonCure Chair and CEO Robert Niven. “CarbonCure now proudly provides to our customers all the tools they need to measure and reduce their carbon emissions, increase their profitability and ensure a competitive edge in the rapidly growing green building market.”

The launch of CarbonCure Express EPD comes on the heels of the passage of the U.S. Inflation Reduction Act. The new federal law includes major investments, including \$250 million to assist EPD adoption and more than \$4 billion to specify low-embodied carbon concrete and other materials for federal buildings and transportation projects. Paired with the Buy Clean Executive Order requiring EPDs for all federal construction starting in 2023, U.S. policy is leveraging the government's massive purchasing power to catalyze industry adoption of EPDs and sustainability.

Meanwhile, a recent Dodge Construction Network Smart-Market Brief reveals that the broader construction sector is actively seeking to reduce concrete's carbon footprint, with 81 percent of structural engineers and 69 percent of contractors tracking the embodied carbon on their projects. Nearly all of the survey respondents indicate they use EPDs, and 68



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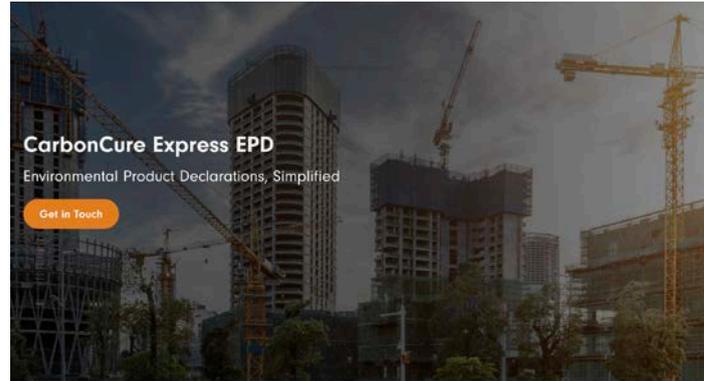
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percent of those EPD users report that their use increased just in the last year.

“As the demand for sustainable construction increases across the public and private sectors, so too does the demand for EPDs,” Niven said. “This is far beyond market signals — EPDs have suddenly become the new industry standard. Designers and builders want to accurately compare the carbon footprint of their materials with product-specific accounting. Using CarbonCure Express EPD, concrete producers can easily and cost-effectively create EPDs for their concrete products without disrupting plant operations.”

“CarbonCure’s solution for EPD generation is simple and yet very smart,” said Heather Brown, Vice President of Quality Control & Quality Assurance at Irving Materials, Inc. (IMI), which uses CarbonCure Express EPD across its plant network. “IMI is committed to sustainability and delivering to our customers in the construction sector the same, high quality concrete products with a lower carbon footprint. With CarbonCure, we offer the market an accurate benchmarking of the environmental factors of our concrete mixes while we continue to deliver the exceptional products and services that define us.”



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NEWS

Utility Begins Loading Fuel at New Georgia Nuclear Plant By Jeff Amy | Associated Press

ATLANTA (AP) — Workers have begun loading radioactive fuel into a new nuclear reactor in Georgia, utilities said Friday, putting the first new American nuclear reactor built in decades on a path to begin generating electricity in coming months.

Georgia Power says workers will transfer 157 fuel assemblies into the reactor core at Plant Vogtle, southeast of Augusta, in the next few days. There are already two reactors operating at the plant, with fuel being loaded into a third unit and a fourth unit still under construction.

Chris Womack, chairman and CEO of Georgia Power, the largest unit of Atlanta-based Southern Co., said in a statement that fuel loading shows “steady and evident progress” at Vogtle.

“We’re making history here in Georgia and the U.S. as we approach bringing online the first new nuclear unit to be built in the country in over 30 years,” Womack said. “These units are important to building the future of energy and will serve as clean, emission-free sources of energy for Georgians for the next 60 to 80 years.”

After the 90 tons of uranium oxide is loaded by a crane into the reactor, operating company Southern Nuclear will test whether the plant’s cooling and steam supply system work while fuel is inside the reactor at the super-high temperatures and pressures created by splitting atoms. Operators will then start generating electricity and link the plant to the transmission grid, with the reactor planned to reach commercial operation by the end of March.

The Georgia Public Service Commission approved the new reactors in 2012, and the third reactor was supposed to start

generating power in 2016. The cost of the third and fourth reactors has climbed from an original estimate of \$14 billion to more than \$30 billion.

The Nuclear Regulatory Commission approved plans to load the fuel in August. Approval was delayed because much of the third reactor’s wiring had to be redone after federal regulators found major flaws. Southern Co. also fell behind on inspection documents that had to be completed before the NRC could sign off.

Georgia Power’s 2.7 million customers are already paying part of the financing cost and state regulators have approved a monthly rate increase of at least \$3.78 a month as soon as the third unit begins generating power. But the elected five-member Public Service Commission will decide later who pays for the remainder of the costs. The utility has other unrelated rate increases awaiting a decision.

The fourth unit is supposed to be completed in late 2023. The two new units combined are projected to produce enough power for more than 500,000 homes and businesses.

Vogtle is the only nuclear plant under construction in the United States. Its costs and delays could deter other utilities from building such plants, even though they generate electricity without releasing climate-changing carbon emissions.

Georgia Power owns 45.7 percent of the two reactors, while Oglethorpe Power Corp. owns 30 percent on behalf of 38 power cooperatives. The Municipal Electric Authority of Georgia owns 22.7 percent on behalf of 49 city-owned utilities, while the city of Dalton’s utility owns 1.6 percent. MEAG has contracts to sell electricity from Vogtle to the city-owned utility in Jacksonville, Florida, and to some electric coopera-



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In this image provided by Georgia Power, the outside of the Unit 3 reactor containment building at Plant Vogtle in Waynesboro, Ga., is shown on Thursday, Oct. 13, 2022. Georgia Power Co. and the other owners of the \$30 billion nuclear plant expansion began loading 90 tons of uranium oxide into the first of two new reactors on Friday, Oct. 14, 2022, aiming to begin generating electricity by March 2023. (Georgia Power Co. via AP)

tives and city utilities in Alabama and the Florida Panhandle.

The other owners of Vogtle are trying to shift costs onto Georgia Power. Oglethorpe, MEAG and Dalton all sued Georgia Power earlier this year, claiming the company was trying to bilk them out of nearly \$700 million by unilaterally changing a contract.

Under a 2018 deal, Georgia Power agreed to assume all cost overruns above a certain level. In exchange, the co-owners would sell part of their ownership shares to Georgia Power. Oglethorpe and MEAG say projected overruns have reached

that level, but Georgia Power said the threshold is \$1.3 billion higher than the level claimed by the co-owners.

Georgia Power is settling MEAG's lawsuit in exchange for making at least \$76 million in payments to MEAG. ☐

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NEWS

SeaPoint Industrial Terminal Complex in Savannah, Ga., Completes Landmark Environmental Remediation Project

SAVANNAH, Ga. — Dulany Industries, Inc. recently announced that SeaPoint Industrial Terminal Complex — an innovative multi-use, multi-tenant industrial terminal site in Savannah, Ga. with a strong focus on sustainability — recently completed a landmark environmental clean-up of the former Tronox/Kerr-McGee site off President Street.

The \$38 million privately funded project, which spans 755 acres and includes 84 distinct work elements, stands apart as the largest brownfield cleanup by area in the history of the Georgia Brownfield Program and was completed ahead of schedule.

“We’re thrilled to complete the environmental remediation at SeaPoint Industrial Terminal Complex and to return this once-fallow industrial site to active use as a major high-wage jobs creator for Chatham County and the State of Georgia,” said Reed Dulany, President and CEO of Dulany Industries, Inc. “We’ve been committed to sustainability since day one, and finishing the cleanup at SeaPoint is an important step toward our vision of a net-zero carbon emissions deepwater terminal complex.”

With more than 600 acres of land for development, a mile of deepwater access on the main shipping channel, an approved 3,000-foot shipping berth, existing rail, utilities and office buildings in a Federal Opportunity Zone, SeaPoint Complex has attracted significant interest from national and international companies interested in expanding to coastal Georgia.

“The former Tronox Pigments facility is an example of what can be accomplished when the parties involved have a shared vision and commitment to achieve it,” said Sara Lips, Director of Communications and Community Engagement for the Georgia Department of Natural Resources Environmental Protection Division. “Dulany Industries’ cooperation and enthusiasm helped navigate the intricacies and interlocking jurisdictions involved in the project, resulting in a cleanup that is protective of human health and the environment.”

The SeaPoint industrial site on Savannah’s eastside was originally developed in the 1950s by American Cyanamid to produce titanium dioxide and was subsequently owned by Kemira, Kerr-McGee and Tronox over the years. In 2009, Tronox filed for bankruptcy and shut down nearly all former operations at the site, resulting in significant high-wage job and tax base losses for Chatham County. As part of the bankruptcy settlement, site ownership was transferred to Green-



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field Environmental Trust Group, with the U.S. Environmental Protection Agency (EPA), Georgia Environmental Protection Division (EPD) and state and federal governments serving as beneficiaries of the trust. In 2013, Dulany Industries, Inc. was selected to purchase the site and to undertake environmental clean-up efforts designed to return the site to productive use, utilizing the site’s one mile of deepwater access.

In 2017, a six-year Corrective Action Plan (CAP) was completed jointly by the U.S. EPA, Georgia EPD, the Greenfield Environmental Trust and Dulany Industries Inc., and was approved by the Georgia EPD in consultation with the EPA. Later that year, Dulany Industries, Inc. finalized the purchase of the almost 1,600-acre site, which was renamed SeaPoint Industrial Terminal Complex, and deeded 728 acres of land to the State of Georgia for marshland protection and as an additional buffer for Old Fort Jackson.

SeaPoint Terminal Industrial Complex received authorization from the U.S. Army Corps of Engineers to construct a new private marine terminal along a one-mile embankment in the Port of Savannah, the third fastest-growing port in the nation, in 2021. The berth is strategically located on the Savannah River’s main shipping channel and will support tenants, like NantRenewables, that share SeaPoint’s commitment to sustainability.

According to a University of Georgia study, SeaPoint will create 1,700+ new high-wage jobs in a federal Opportunity Zone in Savannah, Ga., and generate an estimated annual economic impact of nearly \$1 billion. ■■

Watts Launches 2nd Annual Water Champion Training Challenge

Watts currently is holding its second annual Water Champion Online Training Challenge to be held through Nov. 30, 2022.

Customers will earn double tokens to redeem towards free lifestyle merchandise by completing specially selected training modules on Watts Works Online.

The modules focus on water conservation, energy efficiency, safety/regulation, and sustainability-inspired products and solutions.

Watts Works Online offers industry professionals more than 400 "bite size" training modules (averaging less than 7 minutes long) on a variety of topics to help them develop their knowledge of Watts products, 24/7 from any device.

For more information on all the training opportunities provided by Watts and to access Watts Works Online, go to watts.com/training.



Watts' 2nd Annual Water Champion Training Challenge runs through Nov. 30.

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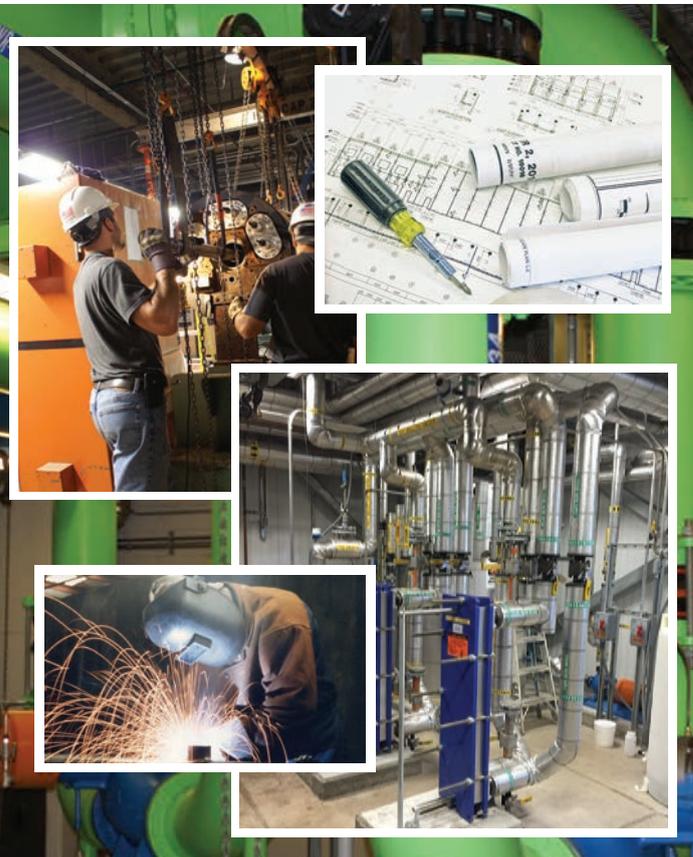


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NEWS

Custom Heater Design Enables Chicago Buildings to Deliver Floor-to-Ceiling Heat

While planning to install linear wall-to-wall convector heaters on a perimeter curtain wall at the 150 North Riverside Plaza high rise in downtown Chicago, the owner sought an effective way to maintain the aesthetic of the building without sacrificing floor space. Custom convection style heaters, along with a custom-shaped bracket developed by Thomas Sales & Marketing, a manufacturer's representative of mechanical and electrical products, leveled the heater perfectly from the top of the windowsill to the preferred section of the wall, proving to be the game-changing solution.

"Convector heaters use the natural air currents that circulate throughout the room and across the unit's heating element to heat the space, ensuring that guests are met with warmth and comfort from the time they enter the building until they leave," said Andrew Martin, manager of Product Management with Marley Engineered Products. "They are ideal for offices, hallways, lobbies, conference rooms, retail stores and other buildings with floor-to-ceiling windows."

Installing Heaters Without Sacrificing Floor Space

Located on the west bank of the Chicago River, 150 North Riverside Plaza features perimeter curtain walls that consist of floor-to-ceiling 12-foot windows. Although the client desired SLQDB Series convector heaters from Marley Engineered Products to be installed for elegant, supplemental comfort for heat loss and condensation prevention, the challenge came from the architectural nature of the project, as well as the need for available floor space in this 10-floor buildout. The client preferred not to see a pedestal mounted convector for aesthetic reasons, nor did they want to lose the six inches of floor space along the perimeter to a heater. Over the entire buildout, it would have resulted in more than 5,000 sq. ft. of lost space.

Another issue revealed itself when the heater could not be wall mounted to the curtain wall because it required drilling into the window mullion, which would have voided the warranty of the window system. Additionally, the level of the curtain wall and lower sill, ranging between 6" and 10", constantly changed throughout the floor, and the heater needed to be mounted level with the windowsill and match the color of the curtain wall.

"The varying heights of the window system limited our ability to install the heaters directly where they needed to be," said David Molk, co-owner of Thomas Sales & Marketing. "Therefore, we needed a custom design that enabled us to

mount the heaters properly."

ABCs of Bracketology: Which Shape is Best?

The solution was the development of a custom bracket with custom length heaters and colors, along with infield cutting/miters and the contributions of several electricians.

Designing the bracket proved to be the largest hurdle as multiple variations were created. The initial version was similar to that of a C-shape. However, after close review and evaluation between all parties, the final iteration was an L-shaped bracket with a custom color to match the curtain wall. This design ended up as the perfect solution because the brackets were ordered to the general height of that section of wall (6"-10"), leveled in field and fastened to the

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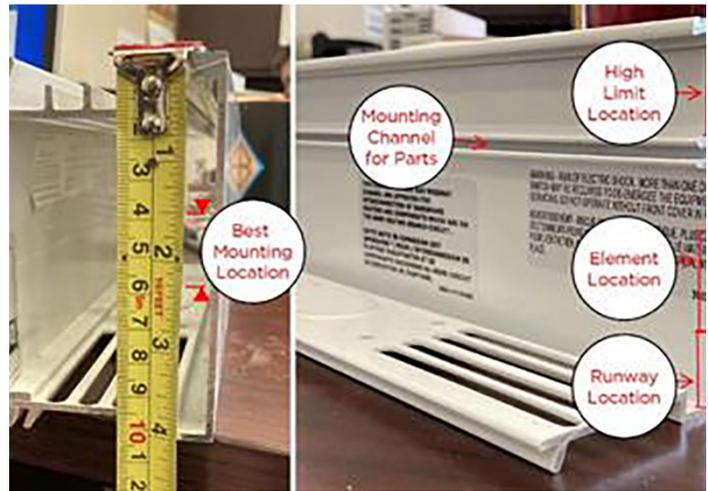
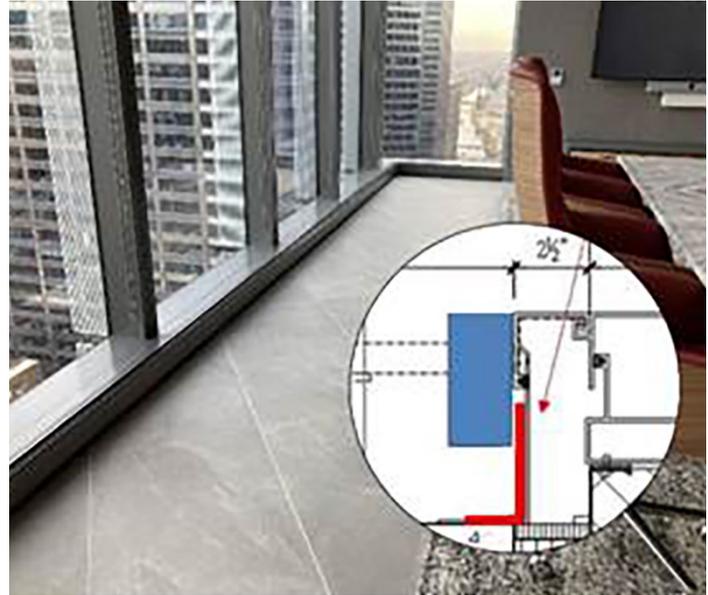
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floor. The installer then marked and welded bolts to the bracket from which the heater was hung.

To make the installation work, the bolts had to be at the perfect dimension from the top of the windowsill down to a portion of the heater that did not impede any internal parts. On top of that, the holes in the back of the heater also had to match exactly with the layout of the bolts for everything to fit properly.

“David designed his own L-shaped bracket to attach to the floor and fit snugly against the window mullion,” said Martin. “The convectors were then attached using bolts welded to the bracket, and everything was painted the same color as the window mullion, creating a clean, finished look and a true example of hidden heat.”

The success of the project resulted in a very happy customer. The general contractor was so pleased, in fact, that the installation method became the go-to standard convector buildout installation technique for the developer and was repeated at two more buildings in Downtown Chicago, at 110 N. Wacker Dr. and 320 S. Canal St. ■



Custom convection-style heaters paired with a custom-shaped bracket proved to be the ideal solution to a problem of maintaining aesthetics while preserving much-needed floor space at 150 North Riverside Plaza in Downtown Chicago.



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NEWS

Johnson Controls Debuts Immersive Distributor Training Program, Graduates Inaugural Class

MILWAUKEE — Johnson Controls, the global leader for smart, healthy and sustainable buildings, is proud to graduate the inaugural class from year one of its new, industry-first Trusted Advisor program. The 40 graduating students received an extensive education that goes beyond product knowledge, making them far more prepared to support contractors than the industry norm. The graduation event was held at the Ducted Systems Academy in Oklahoma City, Okla., in August 2022, and included student presentations, a factory tour and the graduation and award ceremony. Students begin year two in January 2023.

The Trusted Advisor program — an intensive distributor training program that builds territory managers' sales skills — began in August 2021 with 38 instructional weeks. The unique, comprehensive training stands out against the typical, two-week training programs that most manufacturers offer. The program includes a combination of in-person and virtual classes in operations, sales and communications led by Johnson Controls as well as vendor classes led by Service Business Evolution (SBE), Grandy and Associates, and industry expert Scott Ritchey. Students must be nominated by local distributor owners or management throughout North America.

"At Johnson Controls, the success of our partners is directly correlated to our success," said Joshua Coaten, director of business development and sales opportunities, Johnson Controls. "The overall goal of the Trusted Advisor program is to provide new or established territory managers with the education, guidance and support for them to enrich their relationships with contractors. The program goes far beyond product knowledge — it makes them better consultants and separates them from their competitors. It's another example of how Johnson Controls invests in the continued growth of our partners and their businesses."

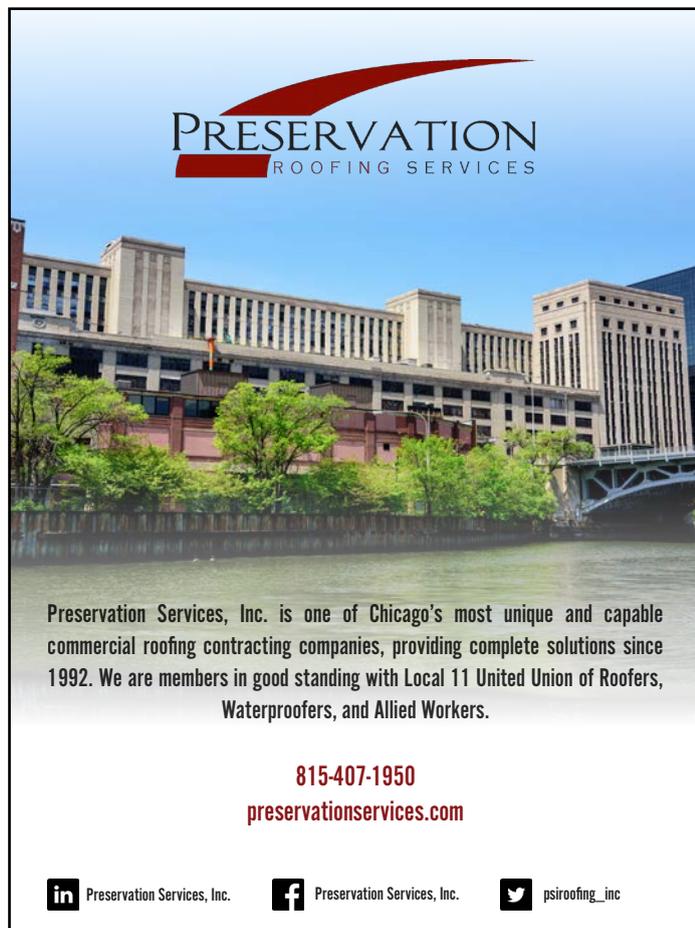
Students focus on various categories throughout the year. The five main class categories are:

- **Soft skills:** Develops work ethic, integrity, honesty in communications and emphasizes the importance of ongoing teachability
- **Sales conversation skills:** Defines communication skills that resonate with contractors, respects social styles and time frames, promotes value propositions, and creates mutual accountability
- **Product knowledge:** Promotes proficiency in product lines, features and benefits, and how products provide advan-

tage in each contractor's market

- **Market knowledge:** Learn market strategies, and territory planning and management as well as what customers create the best business portfolio
- **Account management:** Understand and leverage the best company provided programs for each contractor, define time management systems, and become a Trusted Advisor to best assist contractors in maximizing their profit and growth

Students are tested on their performance to provide benchmarks before, during and after each year of participation, which is featured on a performance dashboard to show how the program is helping distributors move the sales needle.



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Johnson Controls recently graduated its inaugural class from its new Trusted Advisor program, an extensive, 38-week program that prepares students for working with contractors, offering comprehensive training that enables them to go far beyond product knowledge to best serve and support contractors in the field.

To demonstrate this growth, all graduating students from year one prepared a 15-minute presentation on two of the categories of their choice as well as an impromptu topic for the graduation event. The program has had very high engagement, with a 75-percent retention rate. Year two, which begins in January 2023, will build on what graduating students have learned in year one, and involves in-depth

training on critical success factors. In addition, two new classes of students will begin year one of their Trusted Advisor program in January 2023. With these new participants, the program has tripled in size.

"This training program is my favorite of all the trainings I have engaged in," said Kyle Zimmerman, territory manager at Bellevue, Wash.-based Johnstone Supply and Trusted Advisor student. "Taking us on the journey to learn the difference from being a Territory Manager and becoming a true Trusted Advisor is huge. I now want to do everything I can to become a Trusted Advisor."

The graduation ceremony took place at the Ducted Systems Academy, a 30,000-square-foot training center that offers world-class commercial and residential HVAC training. The Trusted Advisor program is managed in a partnership between Johnson Controls Business Development and the Academy.

For more information about the Trusted Advisor program, contact your local Johnson Controls regional account manager. For more information about the Ducted Systems Academy, please visit www.ductedsystemsacademy.com.



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NEWS

Tecogen Receives 250 kW Microgrid System Order for Connecticut High School

WALTHAM, Mass. (GLOBE NEWSWIRE) via NewMediaWire — Tecogen Inc., a clean energy company providing ultra-efficient and clean onsite power, heating and cooling equipment, is pleased to announce an order for two 125-kilowatt InVerde microgrid-enabled cogeneration systems to a high school in Connecticut. The units will provide a significant reduction in the electricity costs for the school, with the free waste heat used to reduce the operational cost of the school's existing heating system. The systems are anticipated to be serviced from Tecogen's Connecticut service center in East Hartford, Conn.

Electric rates in Connecticut are among the highest in the United States, and are anticipated to further increase. The combined heat and power technology incorporated in Tecogen's InVerde cogeneration systems mitigates high energy costs and enables significant reductions in greenhouse gas (GHG) emissions. These attributes are rewarded in the newly expanded Investment Tax Credit (ITC) included in the Inflation Reduction Act passed in August 2022 by making purchasers of combined heat and power systems such as the InVerde eligible for tax credits of up to 40 percent of the project cost.

"We are pleased that this school system in Connecticut understands the cost savings and environmental benefits of our products," noted Benjamin Locke, Tecogen's CEO. "The combination of increasing electric rates, GHG reduction requirements, and incentives provided through the expanded ITC makes the timing for installing efficient energy savings measures such as Tecogen-distributed generation products



The combined heat and power technology built into Tecogen's InVerde cogeneration systems reduces both energy costs and greenhouse gas emissions, allowing purchasers to become eligible for tax credits that can cover up to 40 percent of the project cost.

more compelling than ever. We look forward to the installation and commissioning of this system to quickly provide cost savings and environmental benefits to the school system."

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GAST Clearwater Tackles Surf Pool, Lagoon Waterproofing Challenge

AUSTIN, Texas (GLOBE NEWSWIRE) — GAST Clearwater, a U.S.-based, next-generation water treatment company, artificial beach and property developer, recently unveiled a 10-year-guaranteed waterproofing solution and methodology for surf pools and lagoons at the Surf Park Summit in San Diego, Calif. Dr. Gast, the principal engineer of GAST Clearwater, presented during the Surf Park Summit explaining GAST Clearwater's method.

The industry has been plagued for many years with numerous projects faced with failing or deteriorating waterproofing solutions, compounds or products that perish under wave-generating velocities, costing developers and operators millions. Not only do current technologies and methodologies limit design, application and guest experiences, but they also come at a high financial cost, both CAPEX and OPEX.

GAST Clearwater also announced at the summit that its waterproofing would be backed by a 10-year guarantee, ensuring a watertight solution for the lifetime of the surf pool/lagoon. GAST Clearwater's parent GAST Global is one of the world's oldest and largest waterproofing companies, with over 13,000 successful projects globally. "As GAST Clearwater expands globally as the No. 1 artificial beach/urban lagoon developer, we are delighted to provide a much-needed waterproofing solution to a longstanding problem within the surf pool industry, coupled with our A.L.T.E.P. water treatment solution enabling developers to use sewerage water, we can now offer a turnkey single point responsibility solution to developers and wave generating companies, backed by full warranties and guarantees," said Mr. Kevin Gast, Co-Founder & CEO of GAST Clearwater.

Early in October, GAST co-founder and CEO Kevin Gast participated in the panel discussion about the Future of Water



New waterproofing methods and products from GAST Clearwater are backed by a 10-year guarantee.

at the Goldman Sachs annual Water Symposium hosted in New York.

Mr. Gast spoke in depth during the symposium about GAST Clearwater's groundbreaking A.L.T.E.P. (Advanced Low Tension Electroporation Process) System that has been dubbed the "Tesla" of water treatment due to its capabilities of treating a wide variety of "dirty waters" with no chemicals, no biologicals, no membranes, and a very high throughput that also destroys PFAS. GAST Clearwater's A.L.T.E.P. system represents an evolutionary leap in the water treatment space that is set to revolutionize and disrupt various markets as a result of its low cost, low maintenance, sustainability, and eco-friendliness that provides an unparalleled tool for the surf park and artificial beach industries.

For an introduction to the GAST Clearwater A.L.T.E.P. system solution, visit bit.ly/3g4E8Et.



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NEWS

Concurrent Technologies Corporation Developing Process to Extract Rare Earth Elements from Coal Byproducts

JOHNSTOWN, Pa. (GLOBE NEWSWIRE) — Concurrent Technologies Corporation (CTC) has received funding from a Pennsylvania state grant for the development of key technologies. The \$1.9 million Department of Community and Economic Development grant will provide funding to support three technical areas.

Through the grant, CTC will continue to develop and implement advanced manufacturing technologies in support of next-generation small modular nuclear reactors and legacy systems associated with operational nuclear power plants. The grant also will enable CTC's continued work to provide small- to medium-sized Pennsylvania businesses with assistance in developing processes and procedures associated with achieving and maintaining compliance with cybersecurity standards.

In a new initiative, CTC will work to prove the feasibility of applying a patented high-temperature technology to extract rare earth elements (REEs) from coal-based sources.

REEs are critical to the production of national defense weapons systems, electronics, advanced motors, power generation equipment, automobiles and more. This technology, if successful in this application, could lead to the development of a domestic supply chain of REEs and create quality jobs in Pennsylvania, as private investors would potentially fund production facilities that would utilize this process on a large scale. In creating a domestic supply of REEs, our nation would not be reliant upon foreign providers of REEs, thereby strengthening the nation's economic potential and enhancing its national security. In addition, this process would aid in eliminating some of the spent coal residuals which can be environmentally hazardous.

"We are pleased to conduct this important and relevant research and development that could create rewards for our Commonwealth and the nation if this technology solution is proven to be feasible," said Edward J. Sheehan, Jr., CTC President and CEO. "CTC is based in Pennsylvania, where spent coal resources are abundant for this technology. We have already been collaborating with some of the larger power plants in western Pennsylvania who possess some of the spent coal byproducts. And our experienced and knowledgeable engineers are leading the effort to leverage patented technology to extract a very valuable constituent from otherwise unusable industrial byproducts."

Pennsylvania Senator Wayne Langerholc, Jr., (R-35), added,



A state-funded initiative to extract rare earth elements from coal byproducts could benefit national security as well as Pennsylvania's economy

"I am pleased to help secure funds for a technology leader such as CTC to develop what could be a significant benefit to our state economy and our nation's military readiness and national security. CTC's 35-year track record of success and strong leadership in technology transition, along with this region's natural resources, create the perfect opportunity to develop this innovative capability." ■■



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At Last, Integrating Snowmelt With BAS is Easily Achieved

By Cleber Alves

Once upon a time, commercial snowmelt systems lived independently, with little concern about the larger mechanical environment they were often a part of. Typically, a boiler provided heat and a smart tubing layout, properly circulated, offered thermal distribution.

Voila! As if by magic, tropical warmth gently melted away midwinter precipitation from parking lots, walkways, ramps and driveways — even in frigid Cold Lake, Alberta.

All good things change, and occasionally for the better. As for modern snowmelt systems, their renaissance has come in the way of — you probably guessed it — improved and more sophisticated controls. Now, snowmelt systems can integrate with BAS (building automation systems).

It only makes sense that snowmelt systems would eventually

cross that bridge. Getting there, however, wasn't without challenge.

BAS networks, by design, are largely “inclusive.” That is, their purpose in life is to integrate, control and monitor as many of a building's key functions as possible, including heating, cooling, ventilation, lighting and other important operations.

Yet, because snowmelt systems operate outside a building, and are exposed to ambient conditions outside the envelope — with conditions that change quickly, often requiring far more than simple on/off function — BAS systems are challenged by their limitations. The key frustration expressed by design engineers, installers and building owners alike is that

(Continued on pg. 26)



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NEWS

(Continued from pg. 25)

the ever-changing nature of outside, ambient conditions defies the constraints of most automated controls.

For this reason, anyone attempting to tie commercial snow-melt function with a BAS confronted a giant hurdle.

Fortunately, those impediments may now be things of the past.

Nature of the Beast

For the longest time, achieving proper connection to and communication between snowmelt controls and a BAS was the seemingly impossible task. The two key parts of that puzzle were a.) sensors didn't want to communicate digitally with the BAS, and b.) controls were mostly incapable of anything more than on-off operation. Maintaining idle operation, controlling gradual increases in temperature, or especially measured deactivation — these became the key challenges.

After all, if snowmelt system deactivation happens too soon, winter accumulations may pile up, or snow may melt prematurely, turning into treacherous ice. Or, if a system demands too much heat, or stays on too long, it punishes the building owner with unexpected operational costs.

For many years, there were many reverse-engineered attempts to connect snow and ice sensors with building automation systems. However, more recently, new technology has been developed to meet this challenge.

This new technology helps connect these two previously disconnected functions by receiving input data and sending information from sophisticated sensors directly to the building automation system, which ultimately tells the snow melting system to turn on or off.

A snow and ice sensor interface communicates directly with a BAS controller through BACnet MS/TP protocol, letting the BAS know to engage the on and off function of a snowmelt system when the outside sensors detect snow or ice. This unique piece of technology has quickly turned a traditionally

inefficient process into a smart and truly automated system.

Having the ability to interface snow and ice sensors directly with any BACnet controller is not only creating more efficient snow melting systems for facility and building owners, it's making it easier for contractors to have a simple, standard solution that can be easily applied to any snowmelt job — without custom coding or complex installation.

Despite its simplicity, connecting a snow and ice sensor interface to a BAS should incorporate many functions, also known as objects (see bullets below). The device itself is designed to be installed in a mechanical room, or at any remote location on site — perhaps in a service room closer to the snow melting area.

The list of data objects shared with the BAS controller should ideally include:

- Snow or ice has been detected
- Snow or ice has not been detected
- Outdoor air temperature
- Slab temperature
- Slab target temperature
- Snow/ice sensor sensitivity
- Warm weather shut down (WWSD)
- Cold weather cut off (CWCO)
- Error codes

As is often the case — and especially when new technology is introduced — questions arise. Here are some common questions from professionals in the field:

What happens if ambient conditions are too cold, or too warm?

Interface features such as warm weather shut down (WWSD) and cold weather cut off (CWCO) are particularly useful in ensuring the snow melting system is only running when needed. For instance, with CWCO, when outdoor air temperature is too cold (below CWCO setting), the BAS heat source is not able to increase the slab temperature to melt snow or ice. Features like this create critical efficiencies and save loads of energy.

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A BAS controller receives input via a BACnet MS/TP protocol, directing it to switch the snowmelt system on and off when outside sensors detect snow or ice, allowing for seamlessly integrated, high-efficiency automation.

With the right technology in place, the interface sends a signal to the BAS to turn off the snow melting system. Once the outdoor air temperature increases above the CWCO temperature setpoint, the interface will communicate to the BAS to turn on the snow melting system and resume its operation.

Of course, if conditions are too warm for the formation of snow or ice, the systems will use the opposite logic (WWSD) and tells the BAS to deactivate the system.

What types of alert functions are available to building managers?

Ideally, a snow and ice sensor interface will use error codes to signal the BAS controller if there are operational problems with the sensors.

This would allow the BAS to have feedback on the system and determine if any action needs to be taken.

Can contractors use the BACnet Sensor Interface with any snowmelt application controlled by BAS controllers?

Here, too — a versatile snow and ice sensor interface should

be compatible with any snowmelt system application. After all, BAS controllers use BACnet MS/TP protocol for communication. The technology should be capable across many types of installations, such as snowmelt applications with a simple dedicated boiler, or more complex multi-boiler plants with multiple zones and mixing valves. And the right technology should be BTL certified, providing the confidence of seamless integration.

Why is it important to control the slab temperature?

Controlling slab temperature is crucial to have an efficient snowmelt system. If the slab temperature is too low, the snow will not melt off. If the temperature is too high, the slab could be damaged and will waste a lot of energy.

Information = Power

So, if you're faced with the need to install — or retrofit — a commercial snowmelt system, and BAS is in the cards, you're now equipped with new information and ready to reenter Winter Warfare. But this time, better prepared.☞

NEWS

Widespread Pipe Repair Technique Sends Nanoplastics Into the Atmosphere, New Study Finds

WEST LAFAYETTE, Ind. — The tiny bits of plastic that wear off bottles, plastic bags, automotive parts and even cosmetics get into the soil and the water supply. They disrupt chemical cycles, throw off ecosystem health and pollute environments both marine and terrestrial. They eventually also get into the air, where they can damage lungs much more effectively. But for that to happen, they have to be worn away by water or earth and then be launched into the sky by winds.

A new study published in *Nature Nanotechnology* has discovered that a process that happens all over the developed world every day accelerates the airborne dispersal of these micro- and nanoplastic particles, posing a risk to human and environmental health. The study was led by Alexander Laskin, professor of analytical chemistry in Purdue University's College of Science.

Laskin is an expert in environmental forensics: He takes complex samples and uses methods of the analytical chemistry to determine what, exactly, is in the air. In this case, what's in the air are previously unsuspected amounts of aerosolized nanoplastics.

The origin of the issue lurks under the ground in every modern city, in technology to repair sewer pipes. When a sewer pipe breaks, the options to fix it are to physically dig a hole around it and replace a section of it or to treat it like the weakened area of a human artery and install a stent.

"What they do," explains Laskin, "is they put a resin-soaked sock into the pipe. That's what it is, effectively — a big sock — and then they cure it into place. It seals the pipe without any need for excavation. It is a very sophisticated and very practical technology. When they inflate the sock, they use pressurized steam, which then emerges as a discharged chemical plume. There's no control on the resulting emissions, and it turns out that they produce a significant amount of pollution, including nanoplastic particles."

The result is that around every modern urban or suburban area where this process takes place, there are uncounted and significant sources of these microplastics and nanoplastics, sources that have not before been considered or examined. Before, scientists thought the only route for plastics to get into the air is slow degradation followed by consistent wind.



Purdue researchers perform testing during a CIPP installation in 2016. (Photo: Purdue University)

"The amount of microplastic and nanoplastic in the atmosphere, floating around, has been explicitly assumed to only come from wind-borne sources. What we show here is that there is a process commonly used throughout the whole modern world that is dumping nanoplastic pollution into the air," Laskin said.

Laskin worked with Andrew Whelton, a Purdue professor of civil engineering and environmental and ecological engineering, to quantify the impact of this cured-in-place pipe repair method, which Whelton has been studying for almost a decade. Whelton's research has helped advise municipalities, utilities and public health agencies on how to lessen environmental pollution from this pipe repair method and protect the workers better.

This new study further unravels the mystery of what exactly is in the air when construction workers repair pipes using the cured-in-place method, something Whelton and other Purdue researchers have been studying for years.

"When we first investigated the plastic pipe air pollution practice, we discovered there had been no independent testing or oversight," Whelton said. "It was being used in neighborhoods and in environmentally sensitive areas, sometimes prompting immediate health impacts to workers, bystanders, emergency responders and the environment. We often see workers who implement this pipe repair standing inside or near the micro- and nanoplastics waste exhaust plumes without respiratory protection. This new study indicates these workers and ones before them have likely been inhaling microplastics and nanoplastics."

The effect of inhaled, aerosolized microplastics on human health has not been widely studied — not least because scientists have not been aware of it as a significant problem. This paper is important, because, like the first studies that heralded the trouble with chlorofluorocarbons, or CFCs, in aerosol sprays (like hairspray). It's the first one to point to a potential significant risk that scientists were previously unaware of. They conducted the chemical imaging measurements of nanoplastics at the Advanced Light Source Synchrotron facility operated by Lawrence Berkeley National Laboratory and at the Environmental Molecular Sciences Laboratory operated by Pacific Northwest National Laboratory, with additional expertise provided by the Sonoma Technology staff. Ana Morales, a doctoral student in Laskin's lab, integrated the observations into the published study as its first author.

"It's not that no one cares about this problem," Laskin said. "But with knowledge comes the need for solutions. Now that we know there is a problem, once we have assessed the issue, now we can develop mitigations and strategies to keep everyone safe."

This study was funded by the National Science Foundation. ☐

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NEWS

Johnson Controls Acquires Rescue Air Systems to Enhance Fire Suppression Portfolio

CORK, Ireland — Johnson Controls, the global leader for smart, healthy and sustainable buildings, recently announced its acquisition of Rescue Air Systems, a leading provider of firefighter air replenishment systems (FARS) that enable firefighters to refill breathing air bottles within a building during responses.

“We are committed to providing the best and most complete fire protection systems in the industry,” said Anna Khanova, vice president, global product management, Johnson Controls fire suppression products. “This equipment allows us to better serve a rapidly growing safety vertical and comply with jurisdictions where FARS are increasingly required by code. As we help improve fire protection in buildings, our customers will benefit from a single, trusted source for residential and commercial fire suppression solutions as well as specialty applications.”

A better alternative to carrying fresh air bottles into a building, FARS stations are designed to replenish firefighters’ air bottles in less than two minutes using a building-installed air standpipe system. Just as water standpipes in buildings provide ready access to water, FARS provide firefighters with quick access to a safer, more constant and more dependable source of breathing air inside a compromised structure in an emergency.

“When we started Rescue Air almost 30 years ago, our goal was to make the world a safer place by equipping buildings and other large structures with firefighter air replenishment systems,” said Anthony Turiello, RescueAir CEO and founder. “With this acquisition, Johnson Controls will help us realize



Johnson Controls’ new acquisition, Rescue Air Systems, provides firefighter air replenishment systems via which first responders can replenish their air with a building-installed air standpipe system.

that vision on a global scale, and we’re excited our product will join their unique suite of fire suppression and safety offerings to better serve our customers.”

Rescue Air Systems, based in San Francisco, will add to Johnson Controls’ comprehensive portfolio of fire suppression products and solutions available today, including fire sprinkler system products, foam agents and hardware, and special hazards products.

To learn more about Rescue Air Systems, visit bit.ly/3EFepMT

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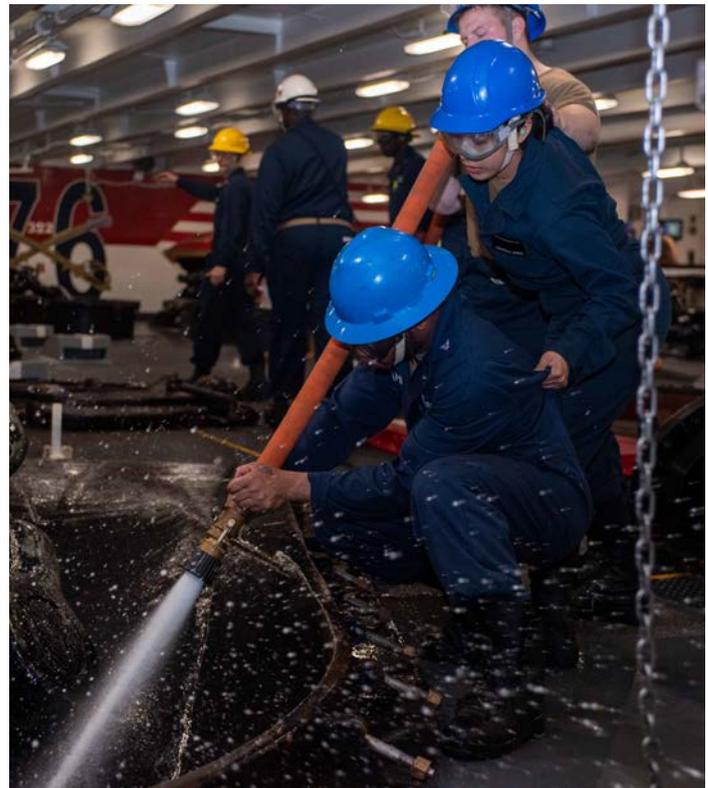
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Chicago Native Cleans Anchor Chain During Sea and Anchor Evolution USS Ronald Reagan

MANILA BAY — Boatswain's Mate 3rd Class Vincent Martin, from Chicago, and Boatswain's Mate Seaman Recruit Samantha Garcia, from Visalia, Calif., clean the anchor chain during a sea and anchor evolution in the forecabin aboard the Navy's only forward-deployed aircraft carrier, *USS Ronald Reagan* (CVN 76), as the ship prepares to depart from Manila Bay, Philippines.

Ronald Reagan, the flagship of Carrier Strike Group (CSG) 5, provides a combat-ready force that protects and defends the United States, and supports alliances, partnerships and collective maritime interests in the Indo-Pacific region. 𠄎



Boatswain's Mate 3rd Class Vincent Martin, of Chicago, works with Boatswain's Mate Seaman Recruit Samantha Garcia to clean the anchor chain aboard the *USS Ronald Reagan* as the ship readies to depart Manila Bay, Philippines. (Photo: U.S. Navy/Mass Communication Specialist 3rd Class Eric Stanton)

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NEWS

Commercial Developers Turn to Concrete Fiber Solutions for Enhanced Slab Designs

BUFFALO GROVE, ILL. — Building developers throughout the Atlanta area are turning to Concrete Fiber Solutions to offer owners and tenants the highest quality slab floors available for manufacturing and distribution facilities. ProSlab® by CFS is a series of engineered concrete floors utilizing steel fiber reinforcement in place of rebar or wire mesh. The superior slab designs are now being installed throughout the Atlanta area, including the Pak-Lite manufacturing facility in Commerce, the Braselton Crossroads distribution centers in Braselton, and the Sherwin-Williams warehouse in Buford. ProSlab by CFS was chosen for each facility in order to reduce cracking and curling of the slab, improve lifetime performance and reduce installation and maintenance costs.

The Pak-Lite manufacturing facility in Commerce, Ga., will feature a 221,478-square-foot ProSlab 25 floor, reinforced with 25 pounds of CFS 100-2 steel fibers per cubic yard of concrete and joints placed at the standard 15-foot spacing. ACI 302 notes that it is unrealistic to expect completely crack- and curl-free floors. An unreinforced floor is unable to reduce crack widths when they occur, whereas ProSlab 25 offers steel fiber reinforcement insurance to reduce crack widths and withstand the wear and tear of manufacturing equipment on the slab surface. Unlike welded wire mesh and rebar, which are located in a single plane and allow cracks to grow until they meet this plane, CFS fibers are distributed uniformly throughout the concrete matrix to meet micro cracks where they originate.

The Braselton Crossroads distribution centers in Braselton, Ga., will feature three buildings totaling more than 461,000 square feet of concrete flooring. The ProSlab 45 floors, reinforced with 45 pounds of CFS 100-2 steel fibers per cubic

yard, feature joints spaced at 50' x 50' in building 200, and 52' x 45' in buildings 300 and 400. ProSlab 45 floors allow for joint spacing up to 58' without any intermediate contraction joints. Eliminating joints not only creates a cleaner look, but also means material handling equipment will perform better and require less maintenance over time.

The Sherwin-Williams warehouse in Buford, Ga., features a 260,624-square-foot ProSlab 65 floor, reinforced with 65 pounds of CFS 100-2 steel fibers per cubic yard of concrete. Joints are spaced at 112' x 108' on a 7-inch slab. The use of CFS steel fibers allows for a thinner slab while maintaining the same level of strength and effectiveness in the concrete. With today's growing focus on sustainability, reducing a slab's thickness by even one inch utilizes significantly less concrete and creates a meaningful impact on the project's carbon footprint.

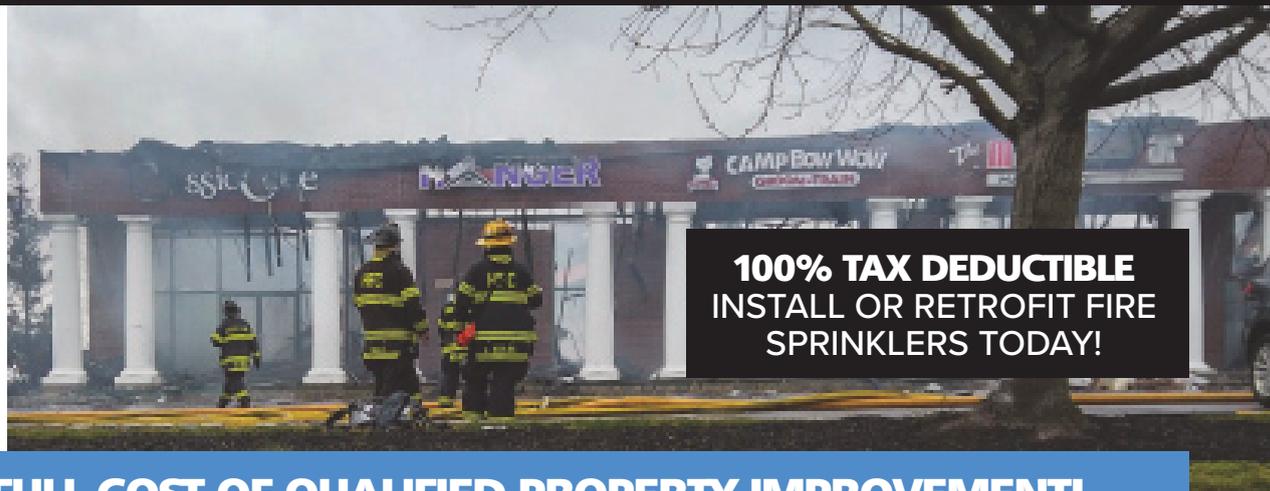
"We're thrilled to bring our products and expertise to these projects and see the use of steel fiber reinforced concrete continue to grow," said Bob Badacour, Southeast Sales Manager, CFS, Inc. "Providing the highest quality floors that will perform for years to come is always our goal, and it was wonderful to work with the experts at AM Concrete, along with the great teams of developers, engineers and contractors, to make that happen."

"The CFS team brings a solid partnership and the highest quality fibers to projects," said Kevin Cox, President, AM Concrete. "The slabs at each of these locations look great now and will continue to look great and perform years into the future." ■■■



ProSlab by CFS, employing steel fiber reinforcement in lieu of rebar or wire mesh, are now being widely installed in the Atlanta area.

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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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NEWS

The Advantages of Soundproofing Patio Doors in Commercial Properties

To resolve noise intrusion through sliding glass doors and improve rent or lease values, multi-unit property managers are turning to true soundproofing companies like Soundproof Windows, Inc., a national manufacturer of window and patio door soundproofing products, that have background and expertise engineering products used in the most noise sensitive environments in the world, like recording studios.

The company has created a "second sliding patio door" that can be installed easily inside or outside of the existing door. This consists of a surface mount aluminum frame, track insert, mounting fin, and a sound insulated movable aluminum sash with rolling mechanism. The product is designed specifically to match and function like the original door, no matter its design, and can open and lock separately.

Functionally, the second sliding door reduces noise intrusion due to its laminated glass construction, the air space separating the original and soundproof door, and improved long-lasting seals. The combination can reduce external noise by up to 95 percent.

The first noise barrier is laminated glass, which dampens sound vibration much like a finger on a wine glass stops it from ringing when struck. An inner PVB layer of plastic further dampens sound vibrations.

Air space of 2-4 inches between the existing sliding door and the soundproof sliding door also significantly improves noise reduction because it isolates the door frame from external sound vibrations.

Finally, the company places spring-loaded seals in the second sliding door frame. This puts a constant squeeze on the glass panels, which prevents sound leaks and helps to stop noise from vibrating through the glass.

Such soundproofing in commercial properties can also provide substantial benefits in reducing energy costs. Adding another sliding door or window provides an additional layer of insulation, which can reduce the heating-cooling portion of energy bills by 15-30 percent. This also helps to stop air infiltration around leaky seals, which improves comfort and increases the property's perceived value.

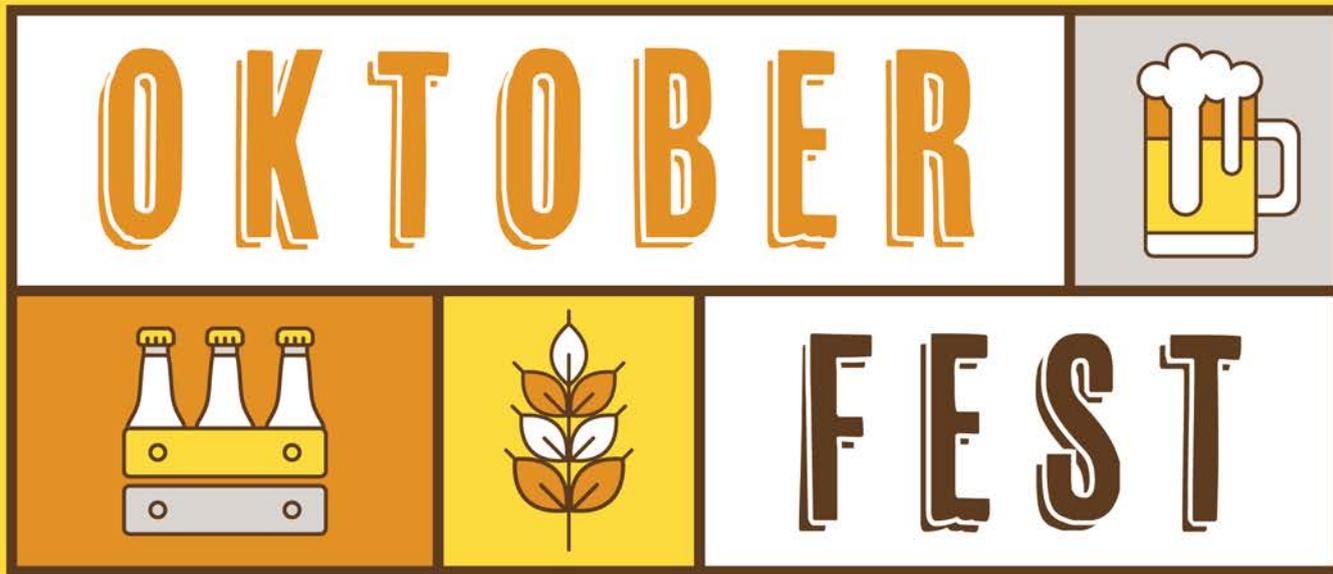
Another important side benefit to this soundproofing approach is security enhancement since its construction helps to deter burglary/breaking and entering through typical sliding glass doors. While standard or tempered glass sliding doors can be shattered by a sharp blow, the laminated glass used in such soundproofing offers significant break in protection because it is shatter resistant and tends to remain intact even after repeated blows. Such laminated glass is actually a major



The ability to add a second soundproof sliding patio door can quiet loud outdoor noise intrusion by 75 percent or more.

component of most bulletproof glass.

For more information, contact Soundproof Windows, Inc. at 4673 Aircenter Circle, Reno, NV 89502; call 1-877-438-7843; email sales@soundproofwindows.com; or visit <http://www.soundproofwindows.com> ■■



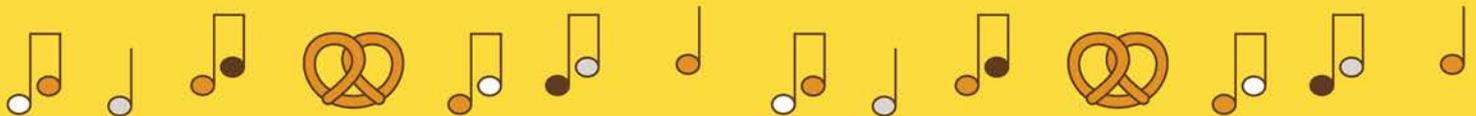
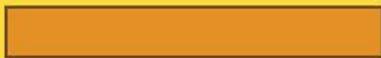
Oktoberfest was a bit of a new experience this year, at Bridge 410, but as always, the good food, good beer and good company made it the memorable event that it was. Our thanks, as always, go out to our many generous sponsors who made the night special, including BEAR Construction, Chicago Cooling Tower, CWF Restoration, F.E. Moran and Preservation Services. Please remember to give them your business when you need their services – our Affiliate Members are the best in the business.

Our thanks to everyone involved in the planning and execution of this year's Oktoberfest, including the folks at 410 Bridge, as well as the folks at Fanning Communications, in particular Alex Boerner, who always does a tremendous job setting up these events.

Event sponsors for the monthly meetings and other events are always welcome and appreciated. Any organizations interested in co-sponsorship of future CEAC events should feel free to contact Alex Boerner at ABoerner@chiefengineer.com.

We look forward to seeing everyone at our Christmas gathering on Wednesday, Dec. 14!







LUMENA ENERGY AIMS TO
**BUILD THE
FUTURE**

by Karl J. Paloucek

You might recall that early last year, *Chief Engineer* magazine ran a story about an ambitious young Chicagoan, David Jones, and his efforts in realizing his vision for virtual power plants. His company, Lumena Energy, continues that mission, but has announced a new initiative to further not just this goal, but to take a great step toward a future dependent on renewable energy and technologies that are truly sustainable instead of merely offering good intentions.

The provisional name of this initiative is Project Kandor.

Project Kandor is a comprehensive effort to build an entire city — in miniature — that will demonstrate all of the principles and technologies needed to realize an exciting, compelling future reliant solely on renewable and sustainable energies. We caught up with Jones at a presentation he gave at the University of Chicago, where he appealed to engineering students to get involved in this groundbreaking project to realize the shape of things to come.

Chief Engineer: It's been a little while since we last spoke. Would you like to bring us up to speed on what you and Lumena Energy have been up to in the meantime?

David Jones: Essentially what we've been able to accomplish over the last couple of years is becoming the world's largest Black-owned virtual power plant, and I would arguably say that we're becoming one of the largest, period. We have a nationwide pilot program that's running, I believe, from upstate Montreal, upstate around New York, all the way to the Dominican Republic, and then on the West Coast as well, to California. We have about 78 nodes that are constantly transmitting data for us. We're working toward decentralizing energy across the planet. I'm a United States citizen, but it's important that our message is extended out further, in the sense that we're basically building this for [the benefit of] disenfranchised communities, as well

as developing countries ... One of the main tenets that we're focusing on at Lumena Energy is just ensuring that there's an equal playing ground for everyone. The cornerstone is going to be renewable energy. Nothing happens without it. You can't have clean drinking water. You can't have access to food. You can't have anything except for breathable air — for the moment — without it. That's kind of why we got into the business of it.

CE: You've referred before to the effort you're making in the direction of solar power as part of a "solarpunk" vision. Can you tell our readers something of what that means?

DJ: Solarpunk — right now it's a literary genre that focuses on creating harmony with the Earth. So instead of a *Matrix*-type scenario, where artificial intelligence has assimilated the human race, the air is full of pollution — a fully dystopian lifestyle? This is the opposite of that. This is a sane reality where renewable energy and sustainable living are put on the forefront. Think about skyscrapers that have moss growing from them that capture carbon. [You] live in Chicago, so I don't have to talk to you about how terrible the pothole situation is. Pieces of road can be taken out like LEGO pieces if they're damaged. They'll have a much longer lifespan, and so forth. Things that are more sustainable so future generations can live in peace, and not have to worry about fighting for resources amongst themselves and other people.

CE: So what is the importance of building this solarpunk city to your overall vision? What's the advantage in going small like this?

DJ: I think that a lot of the emerging technology that exists in the world is kind of abstract. ... What I realized as I've gone through this developmental process of creating virtual power plants is, people don't know what it is. If you can't physically touch something, it won't make sense to the average person. So, if we create a proof-of-concept model city, and we do this 1/16th scale, then that makes it believable. That enables people of all shapes and sizes, all walks of life, to come together. To touch these things. To interact with them. To ask questions of people who engineered them, or who use them every day. That is the big difference. And of course, accelerating the adoption of renewable energy was incredibly important, because eventually, fossil fuels will run out. By our calculations, we're looking at roughly another 53 years before the entire reserve of oil is depleted on Earth. Once that happens, you're basically looking down the barrel of another world war, because we are going to fight over what resources are left.

CE: Can you run us through what your expectations are for Project Kandor? How big it will be, what exactly you envision it to look like, and what it will feature?

DJ: Our facility, the way we are visualizing it, will be roughly one and a half acres. It will be 150 by 150 feet tall and long —



Lumena Energy founder David Jones.

roughly the size of two football fields. So literally, it will be the largest model city on Earth. ... And naturally, living in Chicago, it will be subject to the elements. It's not like living in Hawaii, for instance. So, the types of Impact Technology that will exist, once we actually implement this, are obviously going to be our virtual power plant networks, so you'll be able to see how energy is decentralized and distributed across an entire array that you can walk and see for yourself how that energy works. We have a piece of software [that will enable you] to monitor that in real time. Aeroponic towers are going to be huge. ... We're also verging on new technologies that probably won't see the light of day for the next 50 years — getting into dark matter accelerators. Water synthesizer plants. Geothermal networks.

Roadside EV charging stations also impact technology. I think that, with our governments, what's happening is, there's an inconsistency. I believe there's a lot of what I call 'greenwashing,' so there are initiatives that exist where people *want* to do the right thing, but it's usually just for aesthetics or just getting into the visual of the public eye. But eventually we will run into a bandwidth problem wherein you have 30 million [electric] vehicles on the road, but you have nowhere to charge them.

And then, when you do charge them, it's not like charging a phone. This is a 100-200 kilowatt-hour pack. When trucks get on the road that are EV, there's going to be such a strain on our grids that we're going to collapse. So we're working on, essentially, a miniaturized way to show, 'This is what's possible, and this is how we can mitigate those circumstances.'

(Continued on pg. 40)



Lumena Energy founder David Jones discusses his vision for the future at the University of Chicago, one of the partner organizations for his new initiative, Project Kandor.

(Continued from pg. 39)

CE: What else has you particularly excited for Project Kandor?

DJ: We are working on developing our own miniaturized hyperloop chamber that will navigate the entire campus. That is going to be awesome. ... For those who don't know, a hyperloop chamber is essentially a vacuum chamber that has frictionless motion. You've seen those machines where you put the money into a tube and *shooo!* — that's it. That's hyperloop, basically. But imagine people inside of it. Imagine objects inside of it. And furthermore, imagine those objects and people shooting along at 700 miles an hour. That changes reality. Imagine being able to live in Chicago and work in California. Literally, with hyperloop, that will be possible.

Everyone has seen an EMT fire truck or emergency vehicle, but do you know why they look like that? It's because of horses. Because of the horse-and-carriage system. Our infrastructure's not been improved for 100-something years, now. But imagine EMT vehicles that can glide over traffic. That changes the narrative. That saves billions of lives over the course of the next 100 years.

And — big announcement: On the crest of a tidal wave of press, media, etc., we are going to be working with Marvel, with Disney, in conjunction, to release Project Kandor.

Naturally, this is very much in line with what Wakanda is [from the *Black Panther* franchise of comics and films]. We will be building our project in Wauconda, Ill., which is where that ties back in — see what I did, there? And by the way, this leads up to



University of Chicago STEM Director Matt Hebron discusses student opportunities for involvement in Project Kandor.



David Jones with Sue Clark and Matt Hebron, STEM directors at the University of Chicago, who are helping Jones to connect with engineering students who might wish to help chart out the future.

something much bigger. It's not just going to be a model city — we are, eventually, going to want to work on the real thing.

CE: How are all of the buildings and features going to be created for Project Kandor?

DJ: They'll all be 3D-printed. We actually have a partnership now with a number of organizations that are going to help that come to life. We'll be creating 3D-printed housing, showing miniaturized versions of how houses can literally be fabricated in 24 hours, showing different types of housing that doesn't revolve around squares and boxes. It's more open format, that uses what's called non-Euclidean geometry.

CE: What's the ultimate goal for this project and for Lumena Energy's mission as a whole?

DJ: It's for developing countries, namely on the mother continent, is to be able to have these types of miniature facsimiles to show to people, to get them to understand that this is what it is, come put your hands on it. Come talk to someone who has helped to invent this, or is living in it, or what have you, then bring this technology back home.

CE: How can people get involved with Project Kandor?

DJ: If you go to Lumenaenergy.com/projeckandor, you can at least get on our mailing list, and if you have questions or so forth, you can reach out to me. There's also an e-book we published that talks about the ethos of the company and so forth. You can learn more about us there. ■■■



Staeis represents another Lumena Energy initiative — providing emergency housing for refugees and displaced persons.

NEWS

Cooling Emergency Turns Into No-Cost Upgrade

For a rural county school district in Kentucky, it started with an emergency failure of a cooling tower used in conjunction with the school's HVAC system. The old, metal-clad cooling tower at the area middle school had required significant maintenance over the years. However, the district was hoping to delay the expense of having to replace it along with another metal tower utilized by the high school that was also nearing end of life.

"They needed a new tower, fast. Theirs was in real bad shape from years of rust buildup and they were experiencing all kinds of leaks — panel leaks, gasket leaks, everything," explains Zach McKinney, sales engineer at Bluegrass Hydronics and Pump, which helped the school district with the cooling tower replacement.

Often in an emergency situation, researching for optimal replacement options gets tossed aside for what can be done quickly and easily. Fortunately, for the school district, the team at Bluegrass had experience with advanced engineered-plastic cooling towers. The units would end up solving the two biggest issues the school district was facing: budget and durability.

Going for the Grant

To cut costs, McKinney had a plan. He knew that some engineered plastic cooling towers were now being manufactured with antimicrobial properties. He believed this would qualify them for government funding under the Elementary and Secondary School Emergency Relief (ESSER) program.

Created by the CARES act, ESSER funds are awarded to schools in need of repairing or improving facilities. The caveat being that those improvements must reduce exposure to environmental health hazards. Originally intended for COVID relief, the program was expanded in 2021 to include other environmental health and safety projects that do not have to be directly related to coronavirus.

Antimicrobial engineered-plastic cooling towers were first designed to help prevent the outbreak of the often-deadly Legionnaires' Disease. Unlike metal towers, engineered plastic can be molded so that special antimicrobial additives are compounded throughout the plastic. These resins contain wide-spectrum additives that operate on a cellular level to continuously disrupt and prevent uncontrolled growth of micro-organisms and biofilm within the cooling tower.

"It worked!," McKinney says. "The school district was awarded the grant and was able to acquire both towers at no out-of-pocket expense."

A Textbook Case

The adoption of antimicrobial cooling towers has become increasingly important because of the growing number of outbreaks of Legionnaires' Disease at numerous locations throughout North America. In fact, each year, about 18,000 people are infected with the Legionella bacteria in the United States alone.

Legionnaires' disease is a severe form of lung infection caused by exposure to bacteria known as Legionella. Found naturally in freshwater environments like lakes and streams, Legionella becomes a health hazard when it grows unabated in water that is not properly treated. While this can include showerheads, hot tubs and hot water heaters, a significant number of outbreaks have originated in cooling towers.

"A cooling tower is the perfect breeding ground for Legionella because it's wet and humid and exposed to sunlight," explains McKinney. "The Legionella will colonize the walls of the tower, and the colony will grow bigger and bigger."

Cooling towers have a long history of effectively expelling heat from the water used in many commercial and industrial applications. However, even when they are disinfected and properly maintained, cooling towers are potential breeding grounds for Legionella, according to the Centers for Disease Control and Prevention (CDC).

Legionella bacteria spreads to humans when expelled water vapor or mist containing the bacteria is inhaled. For this rural Kentucky school district, the location of their cooling towers amplified their concerns over this issue.

"One of the towers sits right by the football stadium," says

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Antimicrobial HDPE cooling towers helped Kentucky schools qualify for a government ESSER grant which funded the total cost of two new units.

McKinney. "Can you imagine if they had an outbreak right there with all those people in the stands? That would be bad news!"

Back to School on HDPE

The antimicrobial cooling towers that the school district ultimately selected were manufactured by Delta Cooling (www.deltacooling.com). The company pioneered engineered plastic cooling towers in the 1970s, and recently innovated the first cooling towers that featured antimicrobial resins in not only the fill, but the entire base cooling tower structural material, sump and drift eliminator.

The engineered plastic towers are made from high-density polyethylene (HDPE), which is impervious to the natural and chemical causes of rust and corrosion. The towers are also unaffected by pH from water sources, including evaporation make-up water, and even the water treatment chemicals that attack metal towers from the inside out. This solved the second issue for the school district.

"Durability was a huge part of what won us that job," adds McKinney. "With HDPE, the whole tower is molded in one

piece, so you don't have any of the leaking points that caused the failures in metal towers. Plus, it doesn't hurt that Delta puts a 20-year warranty on their towers. You just don't get that kind of lifespan with metal towers."

To further reduce ongoing cost and maintenance requirements, the school district also wanted to get away from the belt-driven fan systems that require periodic downtime for replacement. The Delta Cooling direct-drive fan eliminates the belts entirely. In addition, the variable-frequency drive (VFD) motor, which requires less horsepower than their previous towers, is already translating into substantial savings on electric power consumption for the school district.

"We are actually already working to roll this out again at other schools," concludes McKinney. "The ESSER funds are still available, and with these antimicrobial HDPE cooling towers, we know we can help other schools improve their situation."

For more information, contact Delta Cooling Towers, Inc., at (800) 289-3358; email sales@deltacooling.com; or visit the website at www.deltacooling.com.

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NEWS

Ontario Office Building Achieves Optimal Heating Performance, Increases Efficiency With Upgraded Boiler System

A multistory office building in Ontario sought to upgrade its two-stage boiler and replace its direct-fired water heater to eliminate short cycling, improve efficiency and provide heating redundancy. Four high-efficiency boilers and one stainless steel indirect-fired water heater from Weil-McLain Canada provided the remedy needed.

"The water heater was deteriorating rapidly, and the boiler was only running at about 85 percent efficiency," said Darrel Gillespie, owner and president of Triple Tech Heating, Air Conditioning and Refrigeration, the HVAC contracting firm who handled the project.

Laying the Groundwork for Optimal Heating Efficiencies

Collaborating with Weil-McLain, North America's leading boiler manufacturer, the Triple Tech team installed four floor-mounted Weil-McLain 399MBH Evergreen™ boilers complete with 24V low-water cutoffs (LWCO) and innovative control systems, as well as boiler circulator and system supply and outdoor sensors. Complementing the boiler system was the installation of an 85-gallon Aqua Plus® indirect-fired water heater with a digital thermostat and a temperature/pressure relief valve also from Weil-McLain Canada.

"The previous boiler, at two million BTUs, could only be serviced by a G1 tech, which are not readily available," said Gillespie. "If the boiler went down, the building would be without heat; however, with four boilers that can be serviced by a G2 tech, if one needs to be repaired, three more will still run to ensure redundancy and back-up."

Featuring 96.5 percent combustion efficiencies, the durable Evergreens are designed with cutting-edge technology, easy-to-setup controls and flexible functionality for multiple applications to properly match heating loads and contribute to energy savings. Easy to install, use and maintain, they are adaptable for most heating needs, including commercial or large residential applications, and for single or multi-boiler installations.

Additionally, the boilers feature the intuitive and user-friendly Unity™ control system with a built-in lead-lag rotate sequencer that can be used to control various units in a multi-boiler system. The control allows minimum and maximum firing rates to be adjusted for different priorities, which allows contractors to individually customize boilers for each installation. For this installation, the domestic hot water (DHW) maximum firing rate was reduced to match the maximum input of the indirect tank at 190,000 BTUH.

"One of the many features our installers like is that no matter the size of these boilers, they can be floor- or wall-mounted," said Gillespie. "Some boilers in this size range can only be wall-mounted, which can limit their placement in the room. Being able to install them on the floor helps us save on manpower and labor costs since multiple technicians are not needed to mount them on the wall."

Increasing Efficiency While Decreasing Fuel Consumption

To better generate DHW and reduce boiler fuel consumption, an 85-gallon Aqua Plus indirect-fired water heater was also installed. Featuring high output stainless steel heat

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exchangers that deliver superior first-hour ratings and recovery, the unit's compact size allows for easy installation in low ceiling basements or storage rooms and comes equipped with pre-installed thermostat connections for quick wiring. The digital thermostat ensures precise accuracy for optimal performance while a temperature/pressure relief valve automatically releases water if the pressure or temperature in the water tank exceeds safe levels.

"The ability to install smaller, fully modulating condensing boilers and water heaters is key to energy savings and improved comfort level, because modulating means less on/off cycling and consistent building temperatures," noted Gillespie. "The boilers and water heater will perform according to the building's heat loss in combination with outdoor temperatures."

Top-Notch Performance in One Unified System

The total system turn-down of 40 to 1 allowed the boilers to better match the heating load of the building while the 96.5 percent thermal efficiency increased performance up to 20 percent and eliminated short cycling. Furthermore, using the new Evergreen boilers in conjunction with the Aqua Plus water heater is expected to provide a gas reduction of 25 percent over the previous direct-fired water heater. To maximize the usability of the space, the new equipment was installed along a perimeter wall instead of in the middle of the room.

"Combining the boilers and tank like we did for this project optimized performance greatly," said Gillespie. "With the boiler and indirect tank, we're getting top efficiency in one package." ■■



Four Weil-McLain high-efficiency boilers and a single stainless steel indirect-fired water heater offer the redundancy and efficiency needed for this Ontario site.



Replacement of the old direct-fired water heater and two-stage boiler allowed for greater efficiency, the elimination of short cycling and heating redundancy.

NEWS

White House Aims to Speed Up Pace of Building Infrastructure

By Josh Boak | Associated Press

WASHINGTON (AP) — The White House hosted a summit Thursday, Oct. 13, to help speed up construction projects tied to the roughly \$1 trillion infrastructure law — an effort to improve coordination with the mayors and governors who directly account for 90 percent of the spending.

“This is the first time we’ve tried this in 50 years on this level,” said Mitch Landrieu, the White House’s infrastructure coordinator and the former mayor of New Orleans. “We’re going to really push hard to make it go faster and try to do it better, and try to get at least all the federal agencies focused on accelerating the pace of design, construction, permitting.”

The summit began that morning and comes at a critical moment for the nearly year-old law as high inflation and worker and material shortages threaten to delay many projects.

At stake is a legacy-making investment championed by President Joe Biden, who has said that it’s the largest set of public works projects since the Interstate Highway System began in the 1950s during Dwight Eisenhower’s presidency. Going into midterm elections this year, Biden has repeatedly told voters that the government can deliver results with Democrats and Republicans working together.

Administration officials plan to use the summit to smooth the way for accelerating the pace of construction, which in turn can help to control costs and maximize the value of dollars spent.

The Transportation Department will launch an internal center to provide best practices on project design, planning and construction for state and local leaders. The Commerce Department will have a “Dig Once” effort so that construction workers are not repeatedly punching holes into roads to lay water pipes, broadband connections and electricity and natural gas lines, in addition to other efforts by government agencies and industry groups.

“I just fully expect that the more we work on this, and the better we get, the more money we’re going to save and the more time we’re going to save,” said Landrieu, who will be speaking at the event along with Transportation Secretary Pete Buttigieg and Environmental Protection Agency Administrator Michael Regan, among others.

Roughly 3,000 people were expected to gather in-person and online for the summit. It overlapped with Biden’s being away from the White House as he travels to Western states.

Denver Mayor Michael Hancock will speak on a panel about getting projects done on time. He said that inflation, worker



Workers toil on a bridge over the surface of what will become Interstate 70 north of downtown Denver, as part of a 10-mile-long project, on April 29, 2021. The White House hosted a summit Thursday, Oct. 13, 2022, to help speed up construction projects tied to the roughly \$1 trillion infrastructure law — an effort to improve coordination with the mayors and governors who directly account for 90 percent of the spending. (AP Photo/David Zalubowski, File)

shortages and supply chain issues have each been barriers and cause an increase as high as 30 percent in forecasted costs.

“All of those issues are the most critical threat to what we’re trying to do,” Hancock said.

Denver is using federal funds to ensure that neighborhoods remain connected as express lanes are added to a 10-mile stretch of Interstate 70 that bisects the city. Hancock wanted to ensure that the neighborhoods on either side of the highway were not cut off from each other, which could make it more difficult for children to attend school. Funding from the infrastructure law provided an additional \$14 million to keep neighborhoods intact, with the project scheduled for completion in 2026.

Hancock said that the infrastructure law also created an “unprecedented” opportunity to partner with female and minority-owned contractors.

“We should not let this moment pass by,” he said. ■■

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MEMBER NEWS

J. F. Ahern Named an ENR Top 600 Specialty Contractor

J. F. Ahern has been ranked as one of ENR's Top 600 Specialty Contractors for 2022. Each year, Engineering News-Record (ENR) chooses the top specialty contractors across the United States based on annual results provided by each participating company, and revenue generated during the preceding calendar year. Out of this year's top 600 firms, Ahern achieved a rank of 88th overall. The list also captures the top contractors in various sub-categories. In the Top 20 Firms in Fire Protection and Sprinklers, Ahern continued to hold strong at number 3, also ranking 11th in the Top 20 Firms in Sheet

Metal, and 39th in the Top 50 Firms in Mechanical.

J. F. Ahern Co. is a mechanical and fire protection contractor specializing in HVAC, Plumbing, Controls, Sprinkler, Extinguisher & Alarm and Fabrication for construction and service projects. Founded in 1880, the company has over 1,400 employees servicing commercial and industrial customers across the United States. To keep up with the latest company news and events, visit jfahern.com or follow them on Facebook or LinkedIn.



J.F. Ahern earned an array of distinctions from the Engineering News-Record for 2022.

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Contest Details:

- Safely snap a photo of Altorfer equipment hard at work or resting peacefully between shifts.
- Fill out the form at www.althorfer.com/2022photocontest and submit your photo by 3:00pm on Friday, Nov. 18, 2022.
- Make sure to "like" your photo and promote it by commenting and sharing.
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Altorfer seeks photos of your use of their equipment, through Friday, Nov. 18. (Photo: Altorfer)

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
- Please bear with us as we transition events from virtual to in-person
- Meeting topics, speakers, and times can be found online at www.chiefengineer.org
- A flyer will also be emailed out with relevant information and a meeting registration link
- 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

TECHLINE

Original Moke Brand Back in America After 40 Years With New Electric Moke Californian

LONDON — MOKE International is returning the Moke Californian to America after 40 years with the more powerful and highway-legal Electric MOKE Californian — a zero-emissions reimagining of the original 1964 Mini Moke. MOKE International owns the original 1964 British Motor Corporation Moke trademarks and is recognized in over 100 jurisdictions as the owner of the Moke brand.

The Electric MOKE Californian is hand-crafted in the United Kingdom to the same high specifications and standards as the Electric MOKE that recently went on sale in Europe, but its name is a U.S. market-specific tribute to the 1977 Moke Californian — an updated version of the Mini Moke that was sold in America and ceased production in 1982.

This is the first time a genuine version of the original Mini Moke has gone on sale in the U.S. in more than four decades, and the first time a highway-legal version of the original Mini Moke has been available in America, with a top speed of 50mph. Fully charged, the Electric MOKE Californian offers a range of 80 miles — enough to cruise Route 101 down to Malibu Beach from Santa Barbara. A full charge takes four hours on a US Type 1 charger.

MOKE International is the first 1960s brand to go fully electric, reinventing the Mini Moke through zero-emissions technology to continue its legacy as a design icon and beloved beach accessory.



The U.K.-built Moke Californian is being re-introduced in America for the first time in 40 years, in wholly electric form.

Isobel Dando, CEO MOKE International, said: "This is a momentous time for MOKE International. It's great to be able to offer the U.S. market a genuine MOKE car for the first time in 40 years. The original Moke Californian represented an incredibly important chapter in the company's rich history; we are proud that the MOKE lives on and can be enjoyed in the electric era."

The Electric MOKE Californian's Pure Bloodline

MOKE International, maker of the new Electric MOKE Californian, continues the legacy of the legendary Mini Moke, but reinvented for the electric era. The Mini Moke was born in the heartland of Britain's automotive industry, created by the father of the Mini, Sir Alec Issigonis.

With prototypes built by the British Motor Corporation in 1959, developed under the codename "The Buckboard," the Mini Moke was originally intended to be a lightweight military vehicle that could be parachuted into warzones and help troops traverse rough ground quickly. Marketed domestically as a utility wagon for farmers and workers, it quickly found legions of fans across the globe, especially in the South of France and Australia, where its rugged nature and open top design made it the ultimate beach shuttle. Loaded with surfboards and refreshments, with the wind running through your hair, life was for living.

Countless admirers including The Beatles, The Beach Boys and Brigitte Bardot — all seen driving the Mini Moke in glamorous seaside locations like the French Riviera and the Caribbean — cemented its status as an icon of the Swinging '60s.

While there were many variants of the original Mini Moke made before production ceased in 1993, perhaps the most exciting and desirable was the Moke Californian, which was sold in the U.S. from 1977-1982. Styling-wise, it was a departure from the Mini Moke's utilitarian look which made it popular with a young, fashion-conscious crowd in sun-drenched locations like Playa del Rey and Cayucos.

Still built in the U.K. at a state-of-the-art facility operated by Fablink Group in Northamptonshire, the new Electric MOKE Californian embodies all of the same qualities of the original — fun, freedom, fresh air — but plays its role in keeping some of the world's most beautiful locations clean through zero-emissions technology.

Using a 44hp electric motor and weighing less than 1,800 lbs., the rear-wheel-drive Electric MOKE Californian covers 0-34mph in 4.3 seconds and achieves a top speed of 50mph. A full charge takes just four hours via a Type 1 port and the Californian covers up to 80 miles of range on a single charge.



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TECHLINE

RE+ 2022: SolarEdge to Highlight Residential Ecosystem and New C&I Power Optimizers

SolarEdge Technologies recently showcased its new and expanded smart residential, commercial and utility solar product offering at RE+, at the Anaheim Convention Center, Calif. in September.

Featured at the convention was the new SolarEdge Home Residential ecosystem, including the SolarEdge Home Hub Inverter, SolarEdge Home Battery, Backup Interface, and smart energy devices such as the SolarEdge EV Charger. Connecting the inverter and the battery on the DC side, SolarEdge Home generates more energy and offers more savings for the homeowner while eliminating unnecessary power conversions. This can add up to 10 days of saved energy for every year of use*.

SolarEdge previewed new technology that enables SolarEdge Home to optimize solar energy consumption by controlling appliance usage, both on- and off-grid. The display will also showcase how, through the mySolarEdge app, homeowners can better control, schedule and track their energy usage and savings, taking into account external factors such as weather events and rising utility rates.

SolarEdge's Commercial & Industrial offering will highlight the next generation of S-Series Power Optimizers, now available with SolarEdge Sense Connect, an industry-first safety functionality. The display also included SolarEdge's 120kW three-phase inverter with Synergy Technology, designed to provide more power and enhanced safety features for C&I installations.

The Utility solution introduces the benefits of DC-optimi-

zation to the utility-scale market with the unveiling of a new 330kW utility inverter alongside SolarEdge's new solar tracker solution. ☀️

** When compared to a typical 10kW PV system in self-consumption mode.*



SolarEdge showcased its new and expanded smart residential, commercial and utility solar product offering at RE+.

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Facebook Owner Meta Unveils \$1,500 Virtual Reality Headset: Will It Sell?

By Barbara Ortutay | AP Technology Writer

Facebook parent Meta unveiled a high-end virtual reality headset Tuesday, Oct. 11, with the hope that people will soon be using it to work and play in the still-elusive place called the “metaverse.”

The \$1,500 Meta Quest Pro headset sports high-resolution sensors that let people see mixed virtual and augmented reality in full color, as well as eye tracking and so-called “natural facial expressions” that mimic the wearer’s facial movements so that their avatars appear natural when interacting with other avatars in virtual-reality environments.

Formerly known as Facebook, Meta is in the midst of a corporate transformation that it says will take years to complete. It wants to evolve from a provider of social platforms to a dominant power in a nascent virtual-reality construct called the metaverse — sort of like the Internet brought to life, or at least rendered in 3D.

CEO Mark Zuckerberg has described the metaverse as an immersive virtual environment, a place people can virtually “enter” rather than just staring at it on a screen. The company is investing billions in its metaverse plans that will likely take years to pay off.

VR headsets are already popular with some gamers, but Meta knows that won’t be enough to make the metaverse mainstream. As such, it’s setting office — and home office — workers in its sights.

“Meta is positioning the new Meta Quest Pro headset as an alternative to using a laptop,” said to Rolf Illenberger, founder and managing director of VRdirect, which builds VR environments for businesses. But he added that for businesses, operating in the virtual worlds of the metaverse is still “quite a stretch.”

Meta also announced that its metaverse avatars will soon have legs — an important detail that’s been missing since the avatars made their debut last year. 🦵



A car passes Facebook's new Meta logo on a sign at the company headquarters on Oct. 28, 2021, in Menlo Park, Calif.

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TECHLINE

Customized Energy Solutions' PowerGREEN Demand Management Software Reduces Fritz Winter Peak Demand Cost

PHILADELPHIA (GLOBE NEWSWIRE) — Customized Energy Solutions (CES) has enabled global iron foundry Fritz Winter to reduce its annual peak demand cost with its PowerGREEN Demand Management Software, helping the company remain competitive in the face of soaring energy costs while contributing to grid resiliency.

When CES installed the system in September 2021, it resulted in \$250,000 in energy cost savings through the balance of the year. Through 2022, PowerGREEN has saved Fritz Winter an additional \$400,000 in energy costs, including \$90,000 in June alone. Overall, PowerGREEN has reduced Fritz Winter's peak demand from 22 MW to 15 MW.

CES installed the solution, which helps users save money and earn revenue by prioritizing, optimizing, and controlling energy loads based on needs and parameters, at Fritz Winter's foundry and mechanical machining facility in Franklin, Ky. The software reduces peak demand and coincidental peak demand charges by automating loads for maximum efficiency, predictability and visibility. PowerGREEN gives customers the power to control and set the optimizations on their own, seamlessly integrating with existing control systems and providing accurate and timely reporting capabilities.

Fritz Winter is a supplier and partner of the international automotive, commercial vehicle and hydraulic industries, as one of the largest global foundries. They develop and produce rough and finish part components, as well as complex system components for their customers, with a special focus on innovative lightweight and coating concepts.

Cost remains the primary differentiator among Fritz Win-

ter's competitors in this commodity industry. Rising energy costs and demand are driving price increases for metal and ramping up pressure across many industries, even causing an aluminum plant 100 miles north of Fritz Winter in Kentucky to halt operations earlier this summer and lay off more than 600 workers.

"The PowerGREEN solution was deployed at a fraction of the cost of installing behind-the-meter energy storage or onsite generation," says CES' Director of Product Development, Matt Lollini. "High energy users, especially those process-driven operations that have unpredictable energy consumption patterns, can realize near-immediate ROI and maintain their competitive edge leveraging our software."



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L-com Expands Fiber-Optic Transceiver Product Line

IRVINE, Calif. — L-com, an Infinite Electronics brand and a supplier of wired and wireless connectivity products, recently announced it has expanded its line of fiber-optic transceivers. The more than 300 new coarse wavelength division multiplexing (CWDM) and dense wavelength division multiplexing (DWDM) products represent additional wavelengths, distances and data rates supported, compared to L-com's previous transceiver offerings.

Fiber-optic transceivers convert a switch's or router's electrical signal to an optical signal, then change it back to an electrical signal at the receiving device. L-com's new additions are expected to be particularly useful for telecommunications service providers, cable TV multiple system operators (MSOs), data communications companies and enterprise networks, and in government network applications.

The new fiber-optic transceivers add to the existing portfolio of "grey" wavelength transceivers (850 nm, 1310 nm and 1550 nm) with both CWDM and DWDM wavelength options. The CWDM transceivers are offered in eight different wavelengths (1470 nm through 1610 nm, in 20 nm increments). The DWDM transceivers are offered in 40 different channels, from channels 20 through 59 (1530.33 nm through 1561.41 nm wavelengths, in 0.8 nm increments).

More than 30 of the new models are the first of L-com's that support fiber-optic lines of up to 120 kilometers at both Gigabit Ethernet and SONET OC-48 data rates. Additionally, the product line now features grey 1G and 10G optics for multimode and single-mode fiber-deployments.

This expansion of L-com's line includes more than 100 new offerings in the SFP, SFP+ and XFP form factors. In addition, the new models broaden 29 of the 38 OEM platforms with which L-com's line is compatible, in addition to the standard MSA-compliant versions. The most significant additions are to Ciena, Alcatel 7x50, Alcatel OMNI, Brocade/Foundry, Cisco, Cyan, Huawei, Juniper and MRV.

The new CWDM transceivers and DWDM transceivers handle standard operating temperatures, though custom requests can be made for industrial temperature versions. The new products are part of L-com's full line of fiber-optic transceivers. They are in stock and available for immediate shipment.



L-com's new line of fiber-optic transceivers offers more wavelengths, longer distances and faster data rates.

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NEW PRODUCTS

Taco's New Flow-Through Expansion Tank

Taco offers a new flow-through expansion tank to help reduce environmental conditions necessary for Legionella/ bacteria to flourish. With standard tank volumes ranging from 23 to 528 gallons, the flow-through expansion tank provides precise flow channeling through a patent pending head design.

Constructed, tested, and certified to ASME Section VIII Div. 1, these tanks minimize pressure loss, discourage short-cycling, and are retrofittable to meet ASHRAE Standard 188 on existing designs.

For more information, visit www.TacoComfort.com



Taco's new flow-through expansion tank is designed to reduce the risk of Legionella or other bacterial growth.

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DuPont™ Tedlar® and Seaman Corporation Announce New Shelter-Rite® High Light Transmission Architectural Fabric

WILMINGTON, Del. — DuPont and Seaman Corporation recently announced the launch of a new Shelter-Rite High Light Transmission architectural fabric using transparent Tedlar PVF film. This new architectural fabric is ideal for structures that require natural light such as sports arenas, event venues and greenhouses.

“We are thrilled to continue our long-standing history of collaboration with Seaman Corporation and know their latest innovative offering will meet an important need for the building industry,” said Matt Urfali, Vice President of Sales & Marketing, DuPont Tedlar.

Transparent UV-blocking Tedlar film is an ideal high-performance material that provides decades of durable protection. With excellent weatherability and dirt-shedding properties, Tedlar preserves the life and aesthetics of architectural fabric structures even in extremely harsh environments. It provides high level of protection against ultraviolet (UV) light, moisture, rain, and pollution. Shelter-Rite architectural fabrics with Tedlar have a proven track record of long-lasting performance and aesthetics.

“Our new Shelter-Rite High Light Transmission fabric is just the latest in a long history of providing best-in-class architectural fabric,” said Frank Bradenburg, Business Director of Architectural Fabrics, Seaman Corporation. “With the added protection of Tedlar, our customers know that their fabric structure will perform and look like new for many years.”

To learn more about Shelter-Rite High Light Transmission or to request a sample please visit www.seamancorp.com/products/shelter-rite-architectural-fabrics.



DuPont and Seaman Corporation recently launched its Tedlar PVF-based transparent Shelter-Rite High Light Transmission fabric, ideal for keeping the elements at bay while still admitting natural light.



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NEW PRODUCTS

Gearwrench Bolt Biter Screw Extractors Honored with 2022 Pro Tool Innovation Award

SPARKS, Md. — It's one thing to create a great tool. But it's something different to create something so innovative that it changes the expectation of an entire category of tools. That's what the Gearwrench Bolt Biter™ Screw Extractors have done, and that's why they were recently named a Pro Tool Innovation Award winner. This is the latest piece of hardware awarded to the Bolt Biter family of extraction products, which continues to turn its innovative design into new and useful products for the most demanding tool users.

The annual Pro Tool Innovation Awards (PTIA) began in 2013 and are judged by a panel of professional tradesmen and trade media representatives in plumbing, electrical, MRO, landscaping, general contracting, mechanics and building. This year, more than 465 products were submitted in dozens of categories for a chance to be recognized.

"One of the things we love about Gearwrench Bolt Biter accessories is the understanding that sometimes you have to use the damaged fastener while you wait on a replacement," said the PTIA review team. "Not only do Gearwrench Bolt Biter Screw Extractors provide better bite than others, but it also works in both directions so you can keep components in service instead of waiting around for parts deliveries."

The revolutionary Bolt Biter Screw Extractors use patented tapered sides so the tool sits easily and safely into damaged screws, while the side- and tip-cutting edges provide powerful and consistent extraction. Available in 4- and 10-piece sets, they can be used with a ratchet, wrench or power tool.

"We're thrilled to earn this recognition from PTIA," said senior product manager Jarrett Wolf. "The work we put into our Bolt Biter products comes directly from listening to customers and professional technicians, and they told us they simply couldn't find a reliable tool to remove stripped, frozen and damaged screws. We went to work and created the extraction tool that works. Period."

For more info on the Bolt Biter family of products, visit gearwrench.com.

GET THE WORD OUT.



Gearwrench Bolt Biter Screw Extractors recently were named a Pro Tool Innovation Award winner.

Would you like to have your services or products featured in a video and general meeting webinar?

Contact Alex Boerner at aboerner@chiefengineer.org for details.

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Protect Hands from Prolonged Exposure to Liquids

CLEVELAND — Work-related skin diseases account for approximately 50 percent of occupational illnesses and 25 percent of all lost workdays. Protecting the skin from prolonged exposure to liquids — even clean water — is critical to fighting skin disease. Brass Knuckle® SmartFlex™ Full Coat Liquid Resistant Gloves (BK350) feel light and provide all-over protection from liquid exposure, sealing out liquids and keeping hands dry, to make them less prone to skin diseases.

SmartFlex BK350 provides this allover protection from liquid penetration all while hands get cozy in a soft polyester seamless knit liner. Soft and seamless means long-wearing comfort and nothing to rub or chafe. Meanwhile, the durable natural latex coating covers the full front and back of the hand to seal out moisture.

To reduce the risk of skin disease, consider multipurpose gloves that inspire compliance. For example, protection from liquids may not be enough if a glove's lack of grip prevents the wearer from using the necessary tools for the job. To that end, SmartFlex 350 has an additional double dip of latex foam on the palm that provides excellent grip, abrasion resistance and tear resistance. Although not recommended for oily applications, this glove is an excellent dry or wet gripper virtually anywhere else.

Like all Brass Knuckle gloves, SmartFlex BK350 is made to fit comfortably. Fingers are tapered and curved. Sizing is carefully considered, and gloves are manufactured to the highest tolerances to ensure flex points match up to the wearer's knuckles.

For more information, visit <https://www.brassknuckleprotection.com/>.



Brass Knuckle SmartFlex BK350 liquid-resistant gloves seal out liquid, keep hands dry, and fight work-related skin diseases.



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NEW PRODUCTS

Thomson Introduces Precision Ball Splines That Deliver Robust Rotary and Linear Motion Integration

WOOD DALE, Ill. — Thomson Industries, Inc., a leading manufacturer of linear motion control solutions, has introduced a line of precision ball splines that enable robust delivery of rotary and linear motion on a single shaft. These new components give designers more flexibility to compress an assembly, extend a stroke, distribute a load or otherwise meet modern automation demands.

Ball splines exploit the low-friction torque transmission capabilities of rolling balls and augment that by adding one or more axial grooves, also known as splines, along the assembly shaft. That opens a low-friction path through which the balls move to facilitate low-friction axial displacement, while also transmitting torque.

The new line of Thomson high-precision ball splines is ideal

for high-speed operation in compact spaces such as laboratory automation or semiconductor pick-and-place assembly. They can automate functions that a human might otherwise perform, like opening the cover of a sample jar and pouring it in a test tube. And they are especially cost-effective in industrial robotic applications that require high-speed, precise integration of rotary and linear motion without the wide freedom of movement of robots.

Availability

Thomson precision ball splines are available immediately in lengths up to 300 mm; diameters between 6 and 30 mm standard. Larger diameters of 40 and 50 mm are available upon request. They can handle loads up to 1,000,000 Nmm, speeds up to 10,000 rpm, and with precision of ± 17 microns with or without flanges. Thomson also has extensive customization capabilities to tap holes, add step-down assembly for a radial bearing, build in coaxial holds, or provide just about any modifications a user may need to integrate the ball spline unit into their machine.

For more information on precision ball splines, visit <https://www.thomsonlinear.com/spl>. Precision ball splines are currently stocked for fast delivery throughout North America. ■■



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Thomson Industries' new precision ball splines afford designers greater flexibility to meet modern automation demands.

Steel Window Institute Publishes Article on “The Resilience of Steel Windows and Doors”

CLEVELAND, Ohio — The Steel Window Institute (SWI) announces the publication of a new article detailing the strength and resilience of solid, hot-rolled steel windows and doors. The article, titled “The Resilience of Steel Windows and Doors,” was produced by the institute’s leading manufacturers of steel windows and doors.

Solid hot-rolled steel windows and doors are manufactured from thick gauge steel. The thicker material promotes a more resilient product. It is the strength of solid, hot-rolled steel that enables the graceful, slender lines, larger lites of glass, design flexibility, and weather and impact resistance that give steel windows and doors their remarkable combination of strength and visual appeal.

SWI details additional benefits of steel windows and doors that are highly valued by architects in commercial and residential markets, including unique aesthetic possibilities. Numerous end use applications in countless architectural styles are highlighted in the article.

The article also includes information on the importance of steel windows and doors relative to energy conservation through larger lites of glass, leading to spaces that are more pleasant, healthful, and productive.

The article, “The Resilience of Steel Windows and Doors,” can be downloaded from the SWI website at bit.ly/3TIXzxc. For more information about the institute and its standard of excellence in steel windows and doors, visit steelwindows.com.



A new article is available from a group dedicated to manufacturing windows and doors made from hot-rolled purpose-made steel sections.



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EVENTS

HARDI Conference

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In 2022, HARDI heads to Texas for our Annual Conference. The 2022 Annual Conference will focus on four main themes:

Personal Advancement: How to excel in your organizational role and become energized within your individual growth.

Organizational Development: How businesses can transform within the current industry climate and headwinds.

Business Growth: Focus on how to maximize success, growth and profit in both the short and long term within the Wholesale Channel.

External Impacts: Understanding how to navigate micro and macro factors that influence Wholesale HVACR such as regulation, a fluid economy, the evolution of the contractor, and more.

This design will allow attendees to either curate their own experience by focusing in one strategic initiative or attend a variety of context.

Year after year, HARDI strives to bring you top-notch speakers that provide attendees with real-world, actionable take-aways. This year features a dynamic array of keynote speakers consistent with what attendees have come to expect from the HARDI Conference, in addition to a broad range of featured speakers from varied disciplines. This year's keynote speakers include:

Billy Beane, Executive Vice President of Baseball Operations, Oakland Athletics

With great insight and signature wit, Beane conveys his innovative, winning style of management and leadership, which involves identifying undervalued assets to create and sustain a competitive advantage. By striking parallels between baseball and business, Beane inspires audiences across industries (including healthcare, insurance, finance, etc.) with his unforgettable winning underdog story.

Laura Huang, Professor/Author, Harvard Business School

Laura has spent her academic career studying interpersonal relationships and implicit bias in entrepreneurship and in the workplace. Her research has been featured in the *Financial Times*, *The Wall Street Journal*, *USA Today*, *Forbes* and *Nature*, and she was named one of the 40 Best Business School Professors Under the Age of 40 by *Poets&Quants*.

Dion Flynn, Teacher, Comedian, Performer

Dion Flynn is an improviser, comedian, performer, writer, and Army veteran best known for his impersonation of Barack Obama on *The Tonight Show Starring Jimmy Fallon*, among his more than 100 appearances on the show. He is an expert in fun and innovative ways to help people connect with themselves and others. He co-created The Improvisor's Mindset (with Jeanne M. Stafford) to draw connections between these theatrical skills and the critical skills needed for successful, grounded connection for the spiritual seeker, and an enhanced business and personal life for the rest of us.

Carl Gould, Founder & Chief Discovery Strategist, 7 Stage Advisors

Carl Gould is a worldwide leading authority on business and entrepreneurship. As an entrepreneur, he built three multi-million-dollar businesses by age 40; and as a consultant, he has helped companies like Allstate, *American Idol*, USA Olympic Track, IBM, McGraw-Hill, and the U.S. Army. His company, 7 Stage Advisors, has mentored the launch of more than 5,000 businesses and is one of the farthest-reaching business mentoring organizations in the world.

Matthew Pollard, Founder & CEO, Rapid Growth

Young, energetic, contemporary, relatable, a powerhouse of differentiation, an expert in niche marketing, and a master sales systemization coach, Matthew is passionate about helping organizations thrive and succeed. With five multimillion-dollar business success stories to his name, all before the age of 30, his achievements are reflected in the value and credibility he brings to every presentation.

Anirban Basu, Chairman & CEO, Sage Policy Group

Anirban is one of the Mid-Atlantic region's leading economic consultants. Prior to founding SPG, he was Chairman and CEO of Optimal Solutions Group, a company he co-founded, and which continues to operate. Anirban has also served as Director of Applied Economics and Senior Economist for RESI, where he used his extensive knowledge of the Mid-Atlantic region to support numerous clients in their strategic decision-making processes.

HARDI looks forward to once again bringing HVACR industry leaders together in one place to connect and learn. Mark your calendars to take advantage of the biggest HVACR distribution event.

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ASHRAE UPDATE

Register Early for the 2023 ASHRAE Winter Conference in Atlanta

ATLANTA — Registration is now open for the 2023 ASHRAE Winter Conference, Feb. 4-8 in ASHRAE's global headquarters city, Atlanta, Ga. Registration for the conference provides entry to the co-sponsored AHR Expo, held Feb. 6-8 at the Georgia World Congress Center.

"Each year, the ASHRAE Winter Conference and AHR Expo provides built environment professionals with industry-leading events and experiences and the best resources and presenters to deliver cutting-edge knowledge to address today's challenges," said 2022-23 ASHRAE President Farooq Mehboob, Fellow Life Member. "Attending the Winter Conference and AHR Expo provides a wonderful opportunity to reconnect with colleagues, make new professional connections and inspire innovation thinking. We are thrilled to return to our global headquarters city and look forward to a successful event."

The ASHRAE Winter Conference Technical Program will offer more than 80 technical sessions within nine tracks. Professional development hours can be earned for all sessions and most online sessions upon successfully completing a short quiz.

The complete technical program will be available in the fall. Tracks include:

- Fundamentals & Applications
- HVAC&R Systems and Equipment
- Refrigerants and Refrigeration
- Grid Resilience and Thermal Storage
- Pathways to Zero Energy Emissions and Decarbonization
- Multifamily and Residential Buildings
- Operations and Maintenance
- Building Simulation and Virtual Design in Construction
- Innovative Responses to Supply Chain Challenges (mini track)

In addition to the technical program and AHR Expo, attendees can look forward to updates from Society leaders, general and technical tours around Atlanta, and social events including the Welcome Party at the Georgia Aquarium. Leading up to and during the conference, ASHRAE will also conduct business, committee and technical meetings.

President Mehboob will provide an update on the 2022-23 Society theme, "*Securing Our Future*." Members will be recognized for their industry and Society accomplishments. Major contributors to ASHRAE will also be recognized.

The cost to attend the conference in-person is \$680 for ASHRAE members (\$935 for non-members, which includes an ASHRAE membership for one year).

The cost to attend the conference virtually is \$410 for ASHRAE members (\$460 for non-members, which includes an ASHRAE membership for one year). Company packages are available. Please check the conference webpage for additional pricing.

All registered attendees, both in-person and virtual, will have access to the virtual conference platform during the conference and 12 months post-conference.

To learn more about the 2023 ASHRAE Winter Conference and to register, visit ashrae.org/2023winter.

ASHRAE Supports Ratification of Kigali Amendment to Montreal Protocol

ATLANTA/WASHINGTON, D.C. — ASHRAE is pleased to support the U.S. Senate's bipartisan ratification of the Kigali Amendment to the Montreal Protocol, paving the way for a swift global phasedown of high global warming potential (GWP) hydrofluorocarbons (HFCs), a large driver of climate change, by 2050. The phasedown could prevent a half-degree Celsius of warming by the end of the century.

The amendment was ratified with a 69-27 vote.

The Biden Administration committed to ratify the Kigali Amendment in April 2021 and it was transmitted to the Senate for ratification consideration on Nov. 16, 2021, and advanced out of the Foreign Relations Committee early in the summer of 2022. ASHRAE Standards 15 and 34 were designed to provide essential guidance to protect people and property, and provide a uniform system for assigning reference numbers, safety classifications and refrigerant concentration limits to refrigerants:

- ANSI/ASHRAE Standard 15-2019, Safety Standard for Refrigeration Systems establishes procedures for operating equipment and systems associated with refrigerants.
- ANSI/ASHRAE Standard 34-2019, Safety Classification of Refrigerants provides shorthand nomenclature and assigned safety classes based on toxicity and flammability.

For more updates on ASHRAE's global phasedown efforts and other advocacy initiatives, visit the Government Affairs webpage or contact govaffairs@ashrae.org.

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AMERICAN STREET GUIDE

Historic Homes May Prove to Be More Resilient Against Floods

By Ben Finley | Associated Press

SUFFOLK, Va. (AP) — Whenever historic homes get flooded, building contractors often feel compelled by government regulations to rip out the waterlogged wood flooring, tear down the old plaster walls and install new, flood-resistant materials.

It's a hurried approach that's likely to occur across southwest Florida in the wake of Hurricane Ian. But restorers Paige Pollard and Kerry Shackelford say they know something that science is yet to prove: Historic building materials can often withstand repeated soakings. There's often no need, they say, to put in modern products such as box-store lumber that are both costly to homeowners and dilute a house's historic character.

"Our forefathers chose materials that were naturally rot-resistant, like black locust and red cedar and cypress," said Shackelford, who owns a historic restoration business. "And they actually survive better than many of the products we use today."

Pollard and Shackelford are part of an emerging movement in the U.S. that aims to prove the resilience of older homes as more fall under the threat of rising seas and intensifying storms due to climate change. They hope their research near Virginia's coast can convince more government officials and building contractors that historic building materials often need cleaning — not replacing — after a flood.

In Florida, historic preservationists already fear older homes damaged by Ian may be stripped of original materials because so few craftsmen are available who can properly perform repairs.

"There are some companies that just roll through, and their job is just to come in and gut the place and move on," said Jenny Wolfe, board president of the Florida Trust for Historic Preservation.

Pollard and Shackelford's joint venture in Virginia, the retrofit design firm Building Resilient Solutions, opened a lab this year in which planks of old-growth pine, oak and cedar are submerged into a tank mimicking flood conditions. The tests are designed to demonstrate historic materials' durability and were devised with help from Virginia Tech researchers.

Meanwhile, the National Park Service has been working with the U.S. Army Corps of Engineers on similar research at the Construction Engineering Research Laboratory in Champaign, Ill.

Researchers there have read through construction manuals from the mid-19th and early 20th centuries to assemble everything from tongue-and-groove flooring to brick walls

coated with plaster. The materials were lowered into water containing bacteria and mold to simulate tainted floodwater.

The research may seem glaringly redundant considering all of the older homes that stand intact along the nation's coasts and rivers: Many have withstood multiple floods and still boast their original floors and walls.

Pollard and Shackelford say lumber in older homes is resilient because it came from trees that grew slowly over decades, if not centuries. That means the trees' growth rings were small and dense, thereby making it harder for water to seep in. Also, the timber was cut from the innermost part of the trunk, which produces the hardest wood.

Plaster can also be water resistant, while common plaster coatings were made from lime, a substance with antiseptic qualities.

But here's the problem: U.S. flood insurance regulations often require structures in flood-prone areas to be repaired with products classified as flood-resistant. And many historic building materials haven't been classified because they haven't been tested.

U.S. regulations allow exceptions for homes on the National Register of Historic Places as well as some state and local registries. But not everyone fully understands or is aware of the exceptions, which can be limited.

The far bigger challenge is a lack of expertise among contractors and local officials, Pollard said. Interpretations of the regulations can vary, particularly in the chaos after a major flood.

"You've got a property owner who's in distress," said Pollard, who co-owns a historic preservation firm. "They're dealing with a contractor who's being pulled in a million directions. And the contractors are trained to get all of that [wet] material into a dumpster as quickly as possible."

In Norfolk, Virginia, Karen Speights said a contractor replaced her original first floor — made from old-growth pine — with laminate flooring after her home flooded.

Built in the 1920s, Speights' two-story craftsman is in Chesterfield Heights, a predominantly Black neighborhood on the National Register of Historic Places. It sits along an estuary of the Chesapeake Bay in one of the most vulnerable cities to sea-level rise.

"I still believe I had a good contractor, but flooding was not his expertise," Speights said. "You don't know what you don't know."

Along Florida's Gulf Coast, there are thousands of historic structures, said Wolfe of the Florida Trust. A large number of them are wood-framed houses on piers with plaster-and-lath walls.

Many likely just need to be dried out after Ian, Wolfe said. But only so many local contractors know what to do "in terms of drying them slowly and opening up the baseboards to get circular airflow."

Andy Apter, president-elect of the National Association of the Remodeling Industry, agreed that many contractors aren't well-versed in older building materials.

"There's no course that I know of that teaches you directly how to work on historical homes," said Apter, a Maryland contractor. "It's like an antique car. You're going to be limited on where you can find parts and where you can find someone who's qualified to work on it."

But interest in the resilience of older homes has grown since Hurricane Katrina, which deluged hundreds of thousands of historic structures along the Gulf Coast in 2005, according to Jenifer Eggleston, the National Park Service's chief of staff for cultural resources, partnerships and science.

Eggleston said the park service recognized the growing need to protect older structures and issued new guidelines last year for rehabilitating historic buildings in flood-prone areas.

The guidelines recommend keeping historic materials in place when possible. But they don't list specific materials due to the lack of research on their flood resistance.

That's where the studies come in.

A recent study by the park service and Army Corps found that some historic materials, such as old-growth heart pine and cypress flooring, performed considerably better than certain varieties of modern lumber, Eggleston said.

Those particular floor assemblies could be dried for reuse after so-called "clean water" damage, Eggleston said. But they would likely require refinishing to remove "biological activity," such as mold and bacteria.

Pollard and Shackelford said they're hoping for an eventual shift in practices that will save money for homeowners as well as taxpayers, who often foot the bill after a major disaster.

In the meantime, flooding in historic areas will only get worse from more frequent rainstorms or more powerful hurricanes, said Chad Berginnis, executive director of the Association of State Floodplain Managers.

"Think about our historic settlement patterns in the country," Berginnis said. "On the coasts, we settled around water. Inland, we settled around water." ■■



Co-owner of Building Resilient Solutions, Kerry Shackelford hooks up pine boards that are used to test flood resistance at his lab Tuesday, Oct. 4, 2022, in Suffolk, Va. Whenever historic homes get flooded, building contractors often feel compelled by government regulations to rip out the waterlogged wood flooring, tear down the old plaster walls and install new, flood-resistant materials. But Virginia restorers Paige Pollard and Kerry Shackelford say they can prove that historic building materials can often withstand repeated flooding. (AP Photo/Steve Helber)

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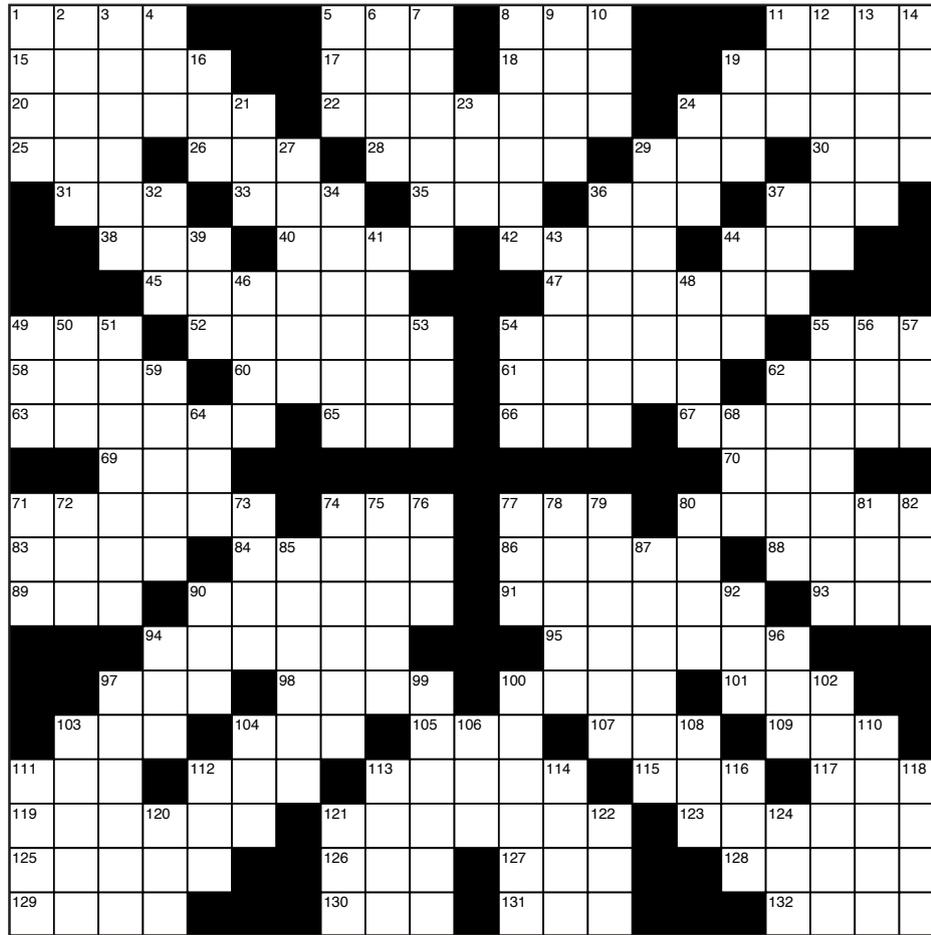
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- 1 Russian ruler
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- 15 Happen again
- 17 Spark
- 18 Fox hole
- 19 Stitch
- 20 In concordance
- 22 Locals
- 24 Baking vegetable
- 25 Cow sound
- 26 Morse code "T"
- 28 Serene
- 29 Thai
- 30 Representative
- 31 Supersonic transport
- 33 Marry
- 35 Sky
- 36 Grease
- 37 Lurked
- 38 Stood opposite
- 40 Lounge
- 42 Sad
- 44 Spacecraft detachment
- 45 Spanish dance
- 47 Plan
- 49 Women's partners
- 52 Supervise
- 54 Resist forcefully
- 55 Pen brand
- 58 Land-rover
- 60 Dry stream bed
- 61 Clerk
- 62 Fall through
- 63 Sounds
- 65 Fall mo.
- 66 Doctoral degree
- 67 Abominable
- 69 Cell stuff
- 70 North American nation
- 71 First courses
- 74 Used to be
- 77 Small amount
- 80 Lowest
- 83 Cain's brother
- 84 Leaven
- 86 Boggle
- 88 Salty water masses
- 89 Mr.'s wife
- 90 Animus
- 91 Suffering
- 93 10 grams (abbr. for dekagram)
- 94 Retell
- 95 Dancer Rogers
- 97 Grovel



- 96 Bone
- 97 Small restaurant
- 99 Noxious vapor
- 100 Sickly
- 102 Hairdresser
- 103 Scare
- 104 Extension (abbr.)
- 106 Time zone
- 108 Center
- 110 "___ et decorum est..."
- 111 Garden tools
- 112 Cause of sickness
- 113 Lubricate
- 114 Holes
- 116 Not max
- 118 Remove unwanted plants
- 120 Great!
- 121 Dunk
- 122 North northeast

- 52 Supervise
- 54 Resist forcefully
- 55 Pen brand
- 58 Land-rover
- 60 Dry stream bed
- 61 Clerk
- 62 Fall through
- 63 Sounds
- 65 Fall mo.
- 66 Doctoral degree
- 67 Abominable
- 69 Cell stuff
- 70 North American nation
- 71 First courses
- 74 Used to be
- 77 Small amount
- 80 Lowest
- 83 Cain's brother
- 84 Leaven
- 86 Boggle
- 88 Salty water masses
- 89 Mr.'s wife
- 90 Animus
- 91 Suffering
- 93 10 grams (abbr. for dekagram)
- 94 Retell
- 95 Dancer Rogers
- 97 Grovel

- 98 "cootie"
- 100 Central points
- 101 Bro. or sis.
- 103 Division (abbr.)
- 104 Make a mistake
- 105 Frozen water
- 107 Short-term memory
- 109 Not good
- 111 Owns
- 112 Cutting tool
- 113 Intense light beam
- 115 That man
- 117 Affray
- 119 Surpass
- 121 Ashcan
- 123 Seed hole maker
- 125 Register
- 126 Large computer co.
- 127 Licensed practical nurse
- 128 Relative
- 129 Store
- 130 Pod vegetable
- 131 East southeast
- 132 Ill ___

DOWN

- 1 Trolley
- 2 Segoe lilies' bulbs
- 3 On the other side
- 4 Regret

- 5 May
- 6 Asian nation
- 7 Literal
- 8 Modifier
- 9 Root vegetable
- 10 Nervous system
- 11 Morse code dot
- 12 Subclass including ticks and mites
- 13 Pampered
- 14 A spinning toy (2 wds.)
- 16 Crimson
- 19 Luau dish
- 21 Beheld
- 23 Three
- 24 Friend
- 27 Capital of Montana
- 29 Men's jewelry
- 32 Bill
- 34 Part of "Colorado"
- 36 Removed from office
- 37 Garden tool
- 39 Male cat
- 41 Philosophy
- 43 Titter
- 44 Be nosey
- 46 Statutes
- 48 Towards
- 49 Coffee brand

- 50 Conger
- 51 Sewing needs
- 53 Eastern Standard Time
- 54 Traveler's aid
- 55 Puffy
- 56 Note of debt
- 57 Hertz
- 59 Punitive
- 62 Punching tools
- 64 Trudge
- 68 Pair
- 71 Surface to air missile
- 72 Abridged (abbr.)
- 73 In ___ (together)
- 74 Carhop
- 75 Spring flower
- 76 Pigpen
- 77 Barrier
- 78 Friend (Sp.)
- 79 Fundamentals
- 80 Floating ice
- 81 Tree
- 82 Chinese flavoring
- 85 Emigrant
- 87 Culmination
- 90 Electro-encephalograph (abbr.)
- 92 Aye
- 94 Reverend (abbr.)

BOILER ROOM ANNEX

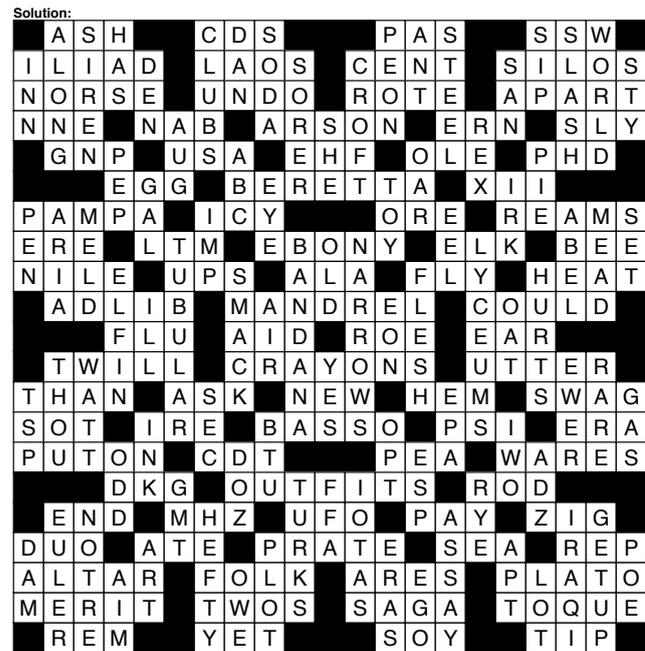
Anatomy of an Engineering Joke
Source: [Reddit.com](https://www.reddit.com)

A classic engineering joke goes something like this:

"There was an engineer who had an exceptional gift for fixing all things mechanical. After serving his company loyally for more than 30 years, he retired. Several years later the company contacted him regarding a seemingly impossible problem it was having with one of its multimillion-dollar machines. He spent a day studying the huge machine. At the end of the day, he marked a small "x" in chalk on a particular component of the machine and proudly stated, "This is where your problem is." The part was replaced and the machine worked perfectly again. The company received a bill for \$50,000 from the engineer for his service. They demanded an itemized accounting of his charges. The engineer responded with the following: 'Chalk: \$1. Knowing where to put it: \$49,999.'"

This oft-retold joke is based on an alleged incident involving German immigrant Charles Steinmetz, an electrical engineer who worked for GE in the early days of hydroelectricity. On this occasion, a hydroelectric generator developed an odd vibration and no one could figure out its origin. Steinmetz was called in and slept next to the generator on a cot, went through his calculations and eventually marked one particular winding set with chalk, specifying that it be removed. This was done, and the problem was resolved. Steinmetz invoiced the company for \$1,000. Asked for an itemization of his expenses by GE's accounting department, who thought the bill outrageous, he submitted: "Chalk: \$1.00. Knowing where to put the chalk: \$999.00."

GE so valued Steinmetz's work for the company during his decades of service that they supposedly paid him with a blank check. Steinmetz was a practical man, and filled it out with only as much as he thought he needed to live. Then, one day, he stopped showing up to work. Someone from the company tracked him down at his home to ask why. Someone in accounting apparently had chastised him for smoking a cigar in the building. Steinmetz told them, "No cigar, no Steinmetz."



OCTOBER SOLUTION

GE repealed the cigar ban.

Time Sheets

Source: anengineersaspect.blogspot.com

An enterprising young engineer was killed in a horrific car accident and arrived in heaven, protesting to St. Peter at the pearly gates. "St. Peter, I'm only 35. I'm much too young to die," he explained. "I have a wonderful wife and family — so much to live for. Why in the world am I here?"

St. Peter looked through a huge stack of papers, looked over the top of his glasses and said, "Well, according to all of these hours on your time sheets, you've got to be at least 108." ☹️

Wrench



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by Jim McGreal

Created by Jim McGreal

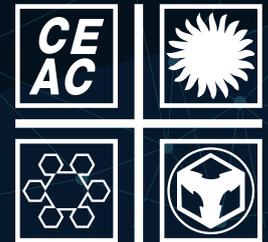
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