The first time Kansas City-based A. Zahner Company used robotics on one of its architectural metal work projects came nearly 10 years ago. The design of a high-end condominium building in New York included 300 stainless steel panels that measured two feet deep by four feet tall by 16 feet long.

Each panel required multiple curvilinear welds covering its entire length, which spurred Zahner to invest in a welding “robot” to assist in carrying out the task.

“If you can imagine a human being doing that, over 16 feet you’re going to get the welder hesitating in different spots, maybe over-welding in one area and under-welding in another area, which would result in an unacceptable level of quality” says Tom Zahner, the company’s chief operating officer.

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FROM THE PRESIDENT

Embracing Technology to Improve Work and Lives

Technology. It’s a topic that generates strong emotions ranging from excitement to worry to fear in the sheet metal industry. It evokes questions about keeping pace, affordability, return on investment, and manhour impacts.

As one who embraces technology, I have found much of the worry is caused by the fear of the unknown. When the Internet started, it was feared that it would eliminate countless jobs across the globe. A McKinsey study in France found that the Internet did eliminate 500,000 jobs over the past 15 years in France, but at the same time, it created 1.2 million other jobs in France, or 2.4 jobs created for every one lost.

As technology impacts our industry, the real issue we all must face is adaptability. This month’s feature article is about the advent of robotics and automation in the sheet metal industry. The article challenges many assumptions about increased automation and how the adoption of robotics will reduce the need for human labor. In almost all situations where automation or robotics makes sense, there needs to be human engagement to set up, control, and support the process. The term “cobot” is used to define this coordinated robot/human manufacturing process.

The cobot concept accelerates the capacity of a shop, enabling contractors to take on more work than they have in the past. Not all work can be accomplished with cobot technologies, but those projects that require highly repetitive tasks and flawless and consistent execution can see dramatic results in both the reduction of time and costs. Clearly, our industry has not fully embraced cobots, but automation processes like plasma cutters, coil lines, and spiral duct machinery have been extremely successful and widely adopted by contractors.

As technology continues to improve our work and our lives, we become more dependent on it. This makes disaster recovery planning that much more critical. As you will see in the other feature story covered in this issue, it is evident that no matter how hard we plan, mother nature can deliver a knockout blow to anyone of us at virtually any time. It was valuable to read that we must all check up on our insurance levels to make sure we are adequately covered for replacement costs and the types of disasters that can hit our areas. As our businesses grow, our coverage must increase proportionally.

As we start to invest in technology and add more sophisticated and expensive equipment to our shops, we must adequately protect our physical assets as much as we protect our intellectual assets. After reading these articles, I know I will be placing a call to my insurance agent, and I am sure you will be checking yours as well.

Sincerely,

Jack Knox
SMACNA President

“Pre-Apprenticeships to Hardhats Act” Would Have DOL Fund Pre-Apprentice Programs

Rep. Donald Norcross (D-1st-NJ) recently introduced the bill “Pre-Apprenticeships to Hardhats Act,” (“PATH” Act, H.R. 6820) to direct the U.S. Secretary of Labor to support development of pre-apprenticeship programs in building and construction that serve underrepresented populations, including those from low-income and rural census tracts.

Norcross, an electrician by trade who went through the IBEW apprenticeship program, intimately understands the apprenticeship system. Introducing legislation for a pre-apprenticeship program is the next step in helping apprenticeship programs offer more career opportunities and skilled workers to contractors, particularly in light the current workforce shortage.

Pre-apprenticeship programs are designed to prepare individuals to enter and succeed in registered apprenticeship programs. To qualify for a grant, the apprenticeship program must demonstrate performance, it could be extended for up to three years, and involve in-training programs under the joint labor/management training system. Introducing legislation for an additional year.

The PATH Act would complement the “Helping America Re-Develop High-Quality Accessible Training Act,” (“HARD HAT” Act, H.R. 6693). The legislation would train the workforce through apprenticeship programs and bar federal agencies from awarding certain construction contracts unless the contractor agrees to require at least 20 percent on a competitive basis to eligible programs by paying the government’s cost of carrying out these development projects. Initial grants would be for up to three years, and if a program shows a satisfactory performance, it could be extended for an additional year.

Nonprofit partnerships such as labor organizations, including joint labor/management training programs like SMACNA and SMART’s joint apprenticeship programs, would be eligible to receive grants. To qualify for a grant, the apprenticeship program must demonstrate experience in implementing and operating worker skills training and education programs, identify and involve in-training programs under the grant, target populations that would benefit from the training, and be actively engaged in in the building and construction trades.

The PATH Act would complement the “Helping America Re-Develop High-Quality Accessible Training Act,” (“HARD HAT” Act, H.R. 6693). The legislation would train the workforce through apprenticeship programs and bar federal agencies from awarding certain construction contracts unless the contractor agrees to require at least 20 percent
How to Weather Disasters: Advice from Contractors Who Survived Them

Randy Novak will never forget the afternoon that he received a call telling him that power was being shut off at the building where his family-owned HVAC company had operated for five decades. The June 11, 2008, announcement by the utility was in response to the overflowing Cedar River. Water was rising to dangerous levels, swallowing major sections of Cedar Rapids, Iowa, and nearby communities.

Randy Novak, president of Novak Heating and Air Conditioning and former president of SMACNA National, was told that he and his staff had 30 minutes to evacuate. He thought it was an overreaction. “I almost mocked it,” he said. “You kind of get in this denial phase because it hasn’t happened before.”

Novak thought their offices and sheet metal shop might see an inch of water. Employees quickly moved a few items to higher shelves and someone grabbed the company’s computer server with all of its client records. Then everyone left.

Two weeks later, Novak returned to his family’s business to find chairs, paperwork, and supplies floating in water 10 feet deep. A natural disaster that almost no one had expected had nearly wiped out what the Novak family has built over 70 years.

Everyone is at Risk
If, like Novak, a contractor thinks a disaster can’t strike their business, they’re mistaken. According to the National Oceanic and Atmospheric Association, since 1980, 219 weather- and climate-related disasters have struck in the U.S., causing an estimated $1.5 trillion in damage. Last year, 16 major disasters hit the U.S., causing a record $306 billion in damage.

From floods and wildfires to tornadoes and hurricanes, no matter where a business is located, it’s likely at risk of being affected by a natural disaster. Experts say regardless of how remote the chances are, contractors should have plans in place to deal with such scenarios.

SMACNA members can support this and other important legislation by contacting their members of Congress through SMACNA’s Take Action web page www.smacna.org/advocacy/take-action.
Fabricating Angled Panels for Missouri Innovation Campus

When the University of Central Missouri partnered with local schools to build the new Missouri Innovation Campus (MIC), they wanted to create a distinctive building design that encompassed “innovation” to showcase the new educational program.

“The design teams at DLR Group and Gould Evans came to us early on to assist with the design of the metal panel system,” said Jeff Mann, president of Standard Sheet Metal (SSM) of Kansas City, Missouri. In fabricating the façade with its angled aluminum skin, SMACNA member SSM created an innovative paneling system on the outside that reflected the innovative learning on the inside.

“We always help contractors and architects during the design phase, in detailing, panel designs, and project budgets,” Mann continued. “We’ve found that if we can assist with questions and details in the design phase, it allows more accurate budgeting and less discussion on overall costs at the end of the project. We have a reputation for quality results and it starts during the design phase.”

SSM worked closely with the designers to devise the custom-fabricated wall cladding system. “We tested paper models and other mock-up panels to find the best approach for this project,” Mann said. “SMACNA standards were critical in determining the overall panel design. We needed to know where to locate brakes and the optimum gage of material to minimize oil canning. We relied on SMACNA’s Architectural Sheet Metal Manual, 7th edition, to determine the width, length, and gage of panels so we could predict the final outcome.”

Working with clear anodized aluminum sheets, SSM explored custom-shaped panels that responded to the design directive. Following SMACNA Standards, SSM recommended 10-foot by 2-foot panels of clear anodized aluminum for the metal panel façade. Each aluminum composite material (ACM) panel had two diagonal bends in the center and an interlocking return at the edge. “It’s simple for us with our level of expertise. It’s basically the same panel fabricated over and over again, with 180-degree rotations,” Mann noted.

SSM then produced a full-scale mock-up for approval by the design team. The mock-ups were attached to the outside of the building for viewing, which enabled the design team to see exactly how the custom panels would look under daylight conditions.

The custom panels gave the project a unique look. “These metal panels cannot be bought as an ‘off the shelf’ item. It’s the only campus in the world to have panels like this, making it both innovative and impactful. All panels were fabricated in house,” said Todd McLellan, SSM project manager. When all was said and done, SSM installed about 1,100 panels on the building.

While the panel concept was simple, installing the specially designed parapet coping and sill were more demanding. “A typical coping would have protruded over the edge of the wall and detracted from the building’s appearance,” Mann explained. “The design team wanted the coping to integrate with the panel system, so it would undulate with the wall and visually disappear.”

More Details
Achieving the goals of the owners required the highest quality workmanship from SSM. “Matching the ins and outs of the panels with the coping cap really showcased the craftsmanship of Sheet Metal Workers Local 2,” McLellan said. “The panels required multiple rounds of samples and test fitting to ensure they would fit together smoothly, requiring increased communications with tight coordination between the shop and field personnel for crating and installation sequences.”

Cleanly executed corners and window returns defined the edges, while custom parapet caps followed the panel forms. Up above the classrooms around the upper level and the rooftop, equipment, SSM provided 3-inch corrugated and insulated wall panels in silver metallic finish. SSM also installed their ACM panels’ open joint rainscreen components with custom gutters and downspouts.

SSM’s work also ensured energy efficiency. “The metal panel sub-girt system utilized a fiberglass clip to prevent thermal bridging, unlike the traditional metal girt system,” McLellan noted. Thermal bridging occurs when a non-insulating material interrupts the insulation of a building, allowing costly heat loss. “The penthouse area also utilized 3-inch thick foam wall paneling, all contributing to energy efficiency.”

The Missouri Innovation Campus’s original appearance has earned awards from the Society for College and University Planning and the Association for Learning Environments. McLellan takes the attention in stride. “These awards just publicize what our team does day-in and day-out” McLellan reflected. “Every one of our team members made this possible. To receive the awards is an honor, but we all expect great quality and execution each and every day and we strive to achieve this on every project we undertake.”

LEARN MORE ABOUT THE PROJECT
https://smac.news/missob6bfb
Central Consolidated Delivers Hospital Air Handler Project

There are few environments where SMACNA HVAC standards are more critical than that of a hospital operating room. Hospitals have unique indoor air quality needs. Air flow, pressure, temperature, and humidity are all closely monitored to safeguard the air that patients’ breath, therefore HVAC equipment selection and installation needs fall under extreme scrutiny. That is why Medxcel chose SMACNA firm Central Consolidated Inc. to replace an air handler that serves the west pod of the surgical unit at Via Christi Hospital, St. Francis in Wichita, Kansas.

Wichita-based Central Consolidated has been doing facility maintenance with the hospital for about five years, and working on the air handler upgrade was important on many levels. “It was a monumental project for the hospital, for our community, and our employees,” said Joseph Samia, president of Central Consolidated. “We have much history with Central Consolidated and they are very familiar with the HVAC systems, hospital operations, infection control needs, and ILSM (interim life safety measures) needs,” said Suja Mathew, project manager for Medxcel. The hospital and Central Consolidated are now in the planning stages to replace the east pod air handling unit in the future.

The Central Consolidated team used SMACNA’s HVAC Duct Construction Standards – Metal and Flexible to design the high-pressure duct spiral duct construction meeting +6-inch pressure class and duct seal class A. These and other specifications help improve the patient’s surgical environment and minimize the spread of airborne contaminants. The new air handler unit design also used ASHRAE standards to provide the hospital with 36,000 cfm, 16 complete air changes per hour, and coordinated performance with existing systems in the facility.

SMACNA’s duct construction standards are complemented by a list of additional health and safety standards written specifically for hospitals and projects like the improvements to St. Francis’ operating rooms. The Joint Commission, ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers), and ICRA (Infection Control Risk Assessment) are some of the other sources for health and safety requirements that impact the design and installation of HVAC equipment in health care settings.

“The SMACNA standards are a critical part of our job as far as the construction standards we use during the fabrication process,” said James Sharp, Central Consolidated’s superintendent for the recent air handler replacement project. “They ensure we fabricate our duct to withstand the pressure classes they will encounter under normal operation.”

“You have to strictly follow all these guidelines,” Sharp continued. “It’s a big deal.”

According to Sharp, alarms will sound in the hospital when air quality does not meet requirements. “We installed some new dampers to make it easier to adjust and fine-tune the system,” he added.

Martin Case, Central Consolidated’s project manager, said that adhering to all the various standards wasn’t, in fact, the biggest challenge with the air handler replacement. The challenge was installation time. They only had a weekend to get the new 98,000-pound air handler up to a ninth-floor roof, all while minimizing disruptions to normal hospital operations.

With such a large air handler unit (AHU), Central Consolidated had to hoist it up in eight separate sections, then assemble them together. The new air handler features two enclosed maintenance vestibules on each side that contained lighting and electrical outlets to accommodate future maintenance needs. They are enclosed to protect against the elements. The AHU also contains chilled water and steam coils, five filter banks, fan banks equipped with modules, a desiccant wheel (for dehumidification), steam injection humidifiers, and ultraviolet air surface treatment.

During hoisting time, Mathew said the hospital had to orchestrate its operations very carefully. They managed the installation around the emergency department ambulance parking area and the hoisting radius area to meet OSHA compliance requirements. Planning for that day required the involvement of multiple hospital stakeholders to deliver a project that met security, life safety, facility quality control, and clinical needs.

“It was a very sensitive, complex project,” she explained. “It takes a village to do a project like this as well as outstanding team communication.”

In Kansas, Via Christi Health operates nine hospitals and 75 other sites of care and employs more than 6,000 associates. Across the state, Via Christi provided $100.7 million in community benefit and care of persons living in poverty in fiscal year 2017.
Contractors Stay Sharp with Residential Comfort Systems Manual

When staff members at Centraire Heating and Air Conditioning Inc. in Eden Prairie, Minnesota, need to refer to the technical aspects of the HVAC systems they’re selling, they often turn to SMACNA’s Residential Comfort Systems Installation Standards Manual.

The eighth edition of the manual, which has been approved as an ANSI standard, covers HVAC equipment installation, engineering considerations, load calculations, hydronic systems, multistory HVAC systems, sound and vibration, duct construction, controls, energy efficiency, and system replacement and residential commissioning.

Lee Seurer, president of Centraire Heating, says the manual is a versatile resource, a “one-stop quick reference guide for the residential contractor who is doing comfort systems in residential homes—be it forced air, be it hydronic, be it heat pumps—whatever. With this manual, you have the basic requirements for any residential comfort system you’d be installing.”

Seurer knows the manual well: He was on the task force that developed the eighth edition. Although it’s aimed at engineers and HVAC contractors, Seurer said he’s had success discussing certain aspects of the manual with homeowners. It’s written in language that’s easy for them to comprehend.

Seurer likes his sales staff to have at least some knowledge of what’s in the manual and know when to refer to its charts and diagrams.

“We’ve used it as a sales tool, showing clients that these are the recommended standards, how to put these systems in, verifying that we know what we’re doing and doing it the right way,” he said. It gives the skeptical customer peace of mind.

The manual also has its place in the company’s training programs for HVAC technicians. “When we bring on new people, we have them go through it because we do a lot of the disciplines that are covered in the manual—forced air, single family homes, steam and hot water, heat pumps and so forth,” Seurer said.

Jeffrey Laski, president and owner of S&M Heating and Air Conditioning in Southfield, Michigan, was chairman of the Residential Comfort Systems Task Force that helped develop and write the revised manual, so he too, knows it well. He said it was due for some updates.

Laski added he often uses the standard to determine the best system to install that is both affordable and energy efficient.

The manual covers a variety of considerations, approaches and codes that contractors deal with nearly every day.

Occasionally, Laski has his sales staff cite the manual to customers to help educate them about the systems S&M is planning to install—or to educate them if customers are considering a quote from the competition.

Even though he’s familiar with it, Laski said he still finds himself looking through its pages. “I look at what’s out there, and even though I know the majority of the manual, it helps bring me up-to-date,” he said.

It’s also useful in the design of a new system, he added. “It helps us put the heating and cooling loads on the building. It helps us take in all engineering considerations,” Laski explained. “We can see the different codes that we have to look out for and what we can use.”

The standard is also referenced by Dave Katt, president of Keystone Heating and Air Conditioning Co. Inc. in Racine, Wisconsin. Like Seurer, he uses it to train his workers.

“When a new guy comes in, we always review it to say ‘Here’s continued on page 15

S&M Heating uses the standard to determine if a system is energy efficient.

In addition to installation, the standard covers duct construction.

Photos courtesy S&M Heating and Air Conditioning.
Renick Bros. Installs Duct for Steamfitters Training Center

Since it was built in 2016, Pittsburgh-based Steamfitters union Local 449 has held several open houses at its $18.5 million technology center in Harmony, Pennsylvania.

The events gave the public a chance to find out what the union’s 2,700 workers do, and how important the HVAC, welding, piping, and other work they perform is to the community.

“It’s uncertain how many of them notice the exposed ductwork and complex fume-collection system that SMACNA member Renick Brothers Mechanical Contractors installed in the training center, but that doesn’t matter to Aaron Davis, Renick’s sheet metal division general manager. He’s proud of the work his employees did to install the HVAC system that serves the training center’s 66 welding booths. Each collector is capable of moving air at 31,500 cubic feet per minute.

The Industrial Look
What made the project unusual was the extensive use of exposed duct—generally rectangular, not spiral, ductwork. The duct would be painted gray. “They were going for that industrial look,” Davis said. “You don’t see that on very many projects.”

What that meant for Davis’ crew was that they would be working extensively with Paint Grip-coated steel. Paint Grip metal has a special coating that allows paint to easily adhere to the metal’s surface. The fabricators and installers would have to be extra careful, since any imperfections could be visible. “Everything had to look very neat and proper,” Davis added.

The project also required 65,000 pounds of ductwork. That put Renick’s sheet metal shop to work at full capacity, making fittings on the company’s Iowa Precision plasma table from Mestek Machinery.

It was a fast-paced project that needed to be completed within nine months, Davis said. Job site organization was therefore extensive, with Davis’ installation crews working alongside contractors handling the building’s sprinkler system, piping, plumbing, conduit, and other trades. “The coordination was very detailed,” Davis said.

SMACNA Standards
It helped that Renick Bros. is experienced in building information modeling (BIM), and it used Autodesk’s Revit software to create a 3D model of the HVAC system before installation to ensure it didn’t clash with the building’s other installing trades.

Also helpful was the knowledge of Renick’s sheet metal workers who are all well-versed in SMACNA standards, using the third edition of SMACNA’s HVAC Duct Construction Standards—Metal and Flexible to complete the project. They often refer to this resource to ensure the ductwork they make satisfies both clients and code inspectors.

“We use that for all our projects,” Davis said. “Regardless of whether it’s industrial or commercial, we always make sure to use SMACNA standards.” Davis said he likes the flexibility the manual gives contractors on making duct while still ensuring it meets the association’s requirements. It helps that the engineering community trusts SMACNA too, he added.

“SMACNA standards are so widely known and widely used that any engineer that I’ve worked with uses SMACNA standards or at least references them,” he said.

Since it opened, the Steamfitters UA Local 449 training center has been cited by the Pennsylvania governor’s office as an excellent example of the kind of skilled training programs the Keystone State needs to meet the required skills of today’s employers.

“We must make the strategic investments in education and training programs that create the skilled talent pipelines for employers to succeed and thrive,” said Jerry Oleksiak, the state’s labor and industry secretary, at a recent tour of the training center. “Growing and expanding apprenticeship and training programs provide employers with well-trained workers while helping job seekers gain the valuable skills they need to obtain family-sustaining jobs.”

Steamfitters UA Local 449 Business Manager Ken Broadbent agreed, saying that’s why the union opened the facility. “We built our new 75,000-square-foot facility to help increase our training capacity and to expand our existing apprenticeship program, which trains workers for free,” Broadbent said.

“Our goal is to produce the most educated, qualified, and productive workers to help meet local employer demand.”
continued from page 1

“For a robot, that’s pretty simple: The welding expert simply programs the robot to follow a specific path at a specific speed and it completes the weld, again and again and again. Mind you, this only works if you have the experienced welder programming and monitoring the weld throughout the process.”

Zahner has also used a robot to fold thousands of small tabs on a project at Cornell University and to apply sealant in a complex pattern on a panel system at Hudson Yards in New York.

Robots are taking on a growing share of work in everything from back-office processing and manufacturing to order fulfillment. Last year saw records set in North America for both orders and sales of robots, according to data from the Association for Advancing Automation, a coalition of automation and robotics industry organizations.

Sheet metal and HVAC contracting work is no exception to the trend, and companies in this sector are still learning about the best ways to utilize automation and robotics in their day-to-day operations.

“Robots” Versus “Cobots”

Technologists are quick to draw distinctions between automation and robotics.

Generally speaking, automation denotes the use of automatic systems to produce and deliver goods and services. Sheet metal contractors have relied for decades on automated technologies and processes, such as automated laser cutting.

Think of robotics as a more specific type of automation. In the context of construction, robotics refers to utilizing programmable devices with the ability to replicate human hand actions, enabling the robots to manipulate tools on a very consistent basis.

Unlike automation, however, robotics is only now beginning to gain ground in the industry. For instance, the A. Zahner Company has used the same robot on three projects in the last 10 years—with several upgrades to the software application managing it.

“We’re definitely only taking baby steps with robotics,” says Tom Zahner.

An important subset of the robotics world is the so-called cobot. Whereas most robots do their work autonomously, cobots work collaboratively with humans to accomplish tasks. With cobots, “the robot might add physical power or precision, but the human would still have control” of the machine, according to Neil Bentley, co-founder of ActiveOps, a global operations management firm.

Benefits: Efficiency, Consistency, and Quality

Welding is just one example of robotics in action in construction. DMI Companies, an HVAC manufacturer based in Pittsburgh, uses robots at subsidiaries Ductmate Industries (a SMACNA Associate Member) and GreenSeam Industries for assembly-line-type tasks, including mixing, sealing, and storing materials and products. DMI’s robots also carry out “pick-and-place” activities, such as moving boxes and materials, as well as separating and sorting laser-cut metal pieces.

Tom Zahner says the universe of applications for robotics in sheet metal contracting is growing. His company employed an intern with a robotics background, Burçin Nalinci, a computational designer with a master’s in architectural technologies, this year to explore using robots to apply finishes to metal and to position parts at odd orientations so that they can be welded together by a welding expert.

Zahner has two robots, one of which is a re-purposed auto plant welding unit that they modified with various grips to hold material in position for a
human to do the actual welding. They are working a test bed stainless-steel project to try out welding techniques.

“We’ve had great success in research and development,” says Tom Zahner. “We think there’s a lot of opportunity in the part-positioning concept. In a lean manufacturing world, movement is waste, and the time it takes to get two parts into position is considered a wasted resource. The quicker a robot can get things organized in the right position, the better.”

Moreover, Raymond Yeager, the president and CEO of DMI Companies, notes that engineers are already working to enhance the safety of working in close quarters with robots, which would further expand the opportunity set for robots within the jobsite.

When it comes to the bottom-line impact of robotics for sheet metal and HVAC contractors, the gains can be difficult to quantify in terms of dollars. Based on return-on-investment analyses, Yeager says he is confident that DMI Companies’ robots and automation technologies pay for themselves. He notes, for example, that robots are improving the efficiency of the companies’ production lines, cutting down on bottlenecks.

Importantly, those in the industry with experience using robotics cite the quality of work and the consistency of the finished products as chief benefits. That means less work on the back end to correct mistakes made during construction and production processes.

“We’ve mitigated, or removed, certain risks that we usually expect to happen” on a construction project, says Tom Zahner.

**The Learning Curve**

Of course, the learning curve for implementing robotics in companies’ operations presents one potential obstacle for sheet metal and HVAC contractors. That means planning ahead, according to Tom Zahner.

“If you have the right people, and they’re engaged, it’s really not that hard” to start using robotics in construction, Zahner says. “It has not been a challenge in our minds, but we went in with our eyes wide open. We had the right people in place at an early enough stage that it was more of a plan, not a reaction.”

In addition to the capital expenditures required to purchase robots (or cobots), contractors have to be willing to invest in training their workforce to operate the new technology. “You need more technical specialists who have experience in how to keep this type of technology running,” Yeager says.

Fortunately, in light of the ubiquity of robotics across the manufacturing sector, it is becoming easier to find employees with the right experience to come into construction, according to Tom Zahner. He can envision a day in which his company starts to filter out the applications of prospective employees who lack experience using robotics. “It is becoming more commonplace for your typical engineer to have some education in robotics,” he says.

**A Blended Workforce: Humans and Robots**

All of the factors involved in using robotics in sheet metal and HVAC contracting ultimately point to changing dynamics within the industry’s workforce. For example, Yeager says he would encourage any construction training program to ensure that they’re keeping up with the evolving requirements of their jobs.

“Robots do not necessarily reduce the workforce,” Yeager says. “They change the workforce.”

Tom Zahner notes that his company’s experiences don’t lead him to believe that broader applications of robotics will result in workforce reductions. Instead, he says, cobots are doing tasks that enhance the ability of the human workers to accomplish their work to the level of quality required within a specified timeframe. “In the world of custom architectural sheet metal manufacturing, a robot is more of an assistant to the process,” he says.

Bentley takes a wholistic view of the forthcoming changes in the workplace. He encourages managers and executives to think of humans and robots, particularly cobots, as co-workers. That idea has wide-ranging implications for companies, involving everything from their organizational cultures to the types of work that their employees do.

“We have to conclude that when technology changes, such as we are seeing now with robots, then we have to think about changes to the whole system,” Bentley says. “We need to think about management operating systems that allow for this blended workforce.”
SMACNA's Technical University Provides Value to Contractors

Contractors will study the newest apps and key technical standards during SMACNA’s upcoming slate of Technical Universities this year. SMACNA’s Technical Universities are scheduled to come to Boston, Massachusetts, on October 24-25; Detroit, Michigan, on October 29-30; and Salt Lake City, Utah, on January 10-11.

SMACNA’s Technical Universities focus on SMACNA standards to help participants understand how to fabricate and construct projects properly and efficiently. Members will study HVAC commercial and industrial applications including duct construction, duct leakage testing, and fire dampers. Participants will also investigate in-depth issues facing the sheet metal industry and learn how the standards can be applied to those issues.

The two-day program will cover duct construction standards for commercial/industrial applications, fire dampers, duct leakage, and technical apps.

In class, participants, including owners, employees, and JATC instructors, will engage in hands-on techniques learned during the program as well as take part in open class discussions, group projects, and work in teams to construct duct with working models. The program is led by SMACNA’s Technical Resources staff.

Participants will also receive all materials covered in the program.

For more information or to schedule a Technical University, contact Eli Howard, SMACNA’s executive director of technical services at ehoward@smacna.org.

CAL SMACNA Addresses Worker-Friendly Climate Change

The California Association of Sheet Metal and Air Conditioning Contractors (CAL SMACNA) was recently invited to discuss how workers can be key beneficiaries of the green economy during a conference on Labor in the Climate Transition at the University of California, Berkeley in September.

Christopher Walker, executive vice president, CAL SMACNA, joined state, national, and international labor leaders at the conference to discuss best practices for good family-supporting jobs while reducing energy use in the industry and how unions can use training to build market share and support a diverse workforce.

The conference identified best practices in worker-friendly climate policy and the importance of labor unions in building coalitions to support strong climate policies at the state, national, and international level. It featured discussions on how to protect good jobs through climate policy, support jobs with clean electricity, how to create alliances, and labor’s role in reducing emissions in the goods movement industries, urban transit, and smart growth. The conference was hosted by UC Berkeley’s Labor Center for Research and Education.

SMACNA’s 75th Annual Convention takes place at the Marriott Marquis San Diego Marina in San Diego, Oct. 14-17.
SMACNA and AMCA Partnership Highlights Ducted Air Systems

SMACNA is joining forces with the Air Movement Control Association (AMCA) to embark on educating HVAC&R industry professionals on the benefits of ducted air systems. AMCA’s 2019 Air Systems Engineering and Technology (ASET) North America Conference is slated for March 25-26, 2019 in Chicago, Illinois. It is just one of SMACNA and AMCA’s partnership efforts that will provide in-depth technical training and education on ducted air systems and its associated products. The conference will also offer multiple track sessions on duct design, fans, dampers, louvers, testing and balancing, and AMCA Certified Rating programs.

The annual ASET engineering conference offers participants such as contractors, engineers, research scientists and technicians, code officials, facility operators, designers, specifiers, and engineering students, structured learning experiences as well as provide peer-to-peer networking opportunities.

In addition, SMACNA and AMCA will present white papers featuring case studies that cover future research projects on energy system comparison of ducted air systems versus non-traditional systems for the HVAC&R industry.

AMCA International works to advance the health, growth, and integrity of the air-movement-and-control industry. Founded in 1917, AMCA represents manufacturers of ducts, fans, louvers, dampers, air curtains, airflow-measurement devices, and other air-system components. In addition to their Certified Ratings Program, AMCA verifies compliance, develops standards, and advocates for model codes, regulations, and utility incentive programs that promote efficiency and life safety.

Members can visit the AMCA website for details on the ASET Conference at www.amca.org/news/ASETConference.php. Registration will open soon.
Weather Disasters

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foot facility was heavily damaged. Most of the sheet metal machinery was ruined, save for a few press brakes. Losses were estimated at over $700,000—none of it insured. For several days, Novak Heating lacked a working phone number, so there was no way to contact customers. Many roads were impassable and Cedar Rapids, a city of 131,000, was largely shut down. "We literally didn’t have a backup plan for anything," Novak said. "We were flying by the seat of our pants, and it’s not a good way to go into a situation like that."

The company created a makeshift office in the basement of Novak’s home, using computers Novak Heating was able to purchase at local electronics stores. SMACNA contractors nationwide offered to help out and fabricate ductwork and ship it to Novak customers. The Sheet Metal Workers union opened its apprentice training facility, which was not affected by the floods, as a fabrication shop for Novak.

“They gave us keys like it was our own place. It made a big difference,” Novak said. “We were overwhelmed by the support.”

Golden State on Guard

In a geographically diverse state such as California, SMACNA contractors have to potentially contend with everything from mudslides and earthquakes to wildfires. It’s rare that someone doesn’t know someone who’s been affected, personally or professionally, by a disaster, said Sean O’Donoghue, executive vice president of Bay Area SMACNA. “We’ve had several lose their homes,” O’Donoghue said.

He said that while Bay Area SMACNA has a disaster plan for its offices in Oakland, California, he’s not sure if the same is true for many members. The chapter may start offering a program to help contractors develop contingency plans, he added.

“It’s one of those things we don’t dismiss as humans—we know the potential—but we don’t prepare for it,” he said. There was probably little that John Modjeski, a senior vice president at University Mechanical and Engineering Contractors, could do to prepare for the arsonist who struck the El Cajon, California, company overnight March 3, 1997. The fire completely destroyed its offices and sheet metal facility.

Despite the disaster, company officials wasted no time in contacting customers and vendors, reassuring them projects would continue and suppliers would be paid—despite losing almost all of the company’s unpaid invoices in the fire.

“Within 24 hours, we had notified all our employees and our clients and assured them their projects would go on unimpeded,” Modjeski recalled. “We had secured temporary office space, placed orders for rental furniture, rental and/or purchase of PCs, had phones and fax forwarded to our (Los Angeles) office, ordered supplies, and checked stock.”

University Mechanical was fully insured for its losses and the rebuilt facility opened seven months later in October 1997. Modjeski said all contractors should have a plan on how to deal with a disaster. “If they’re not sure how to go about it there are a multitude of resources available for support,” he said. “If you do have one, keep it current and annually test the plan to ensure everyone, especially new personnel, are familiar with their responsibilities.”

When the Earth Shakes

An earthquake can be a difficult event to prepare for, especially considering it strikes with little or no warning. Paul Irwin, president of Bell Products Inc., in Napa, California, can attest to the sudden disaster. The mechanical contractor’s facility was damaged in a magnitude 6.0 quake centered just a couple of miles from its shop. The August 24, 2014, South Napa earthquake injured around 200 people, a handful critically, and was blamed for one death. Damage was estimated at $1 billion.
**Hit Hard in Houston**

About 1,900 miles away in Houston, Texas, contractors don’t have to worry much about earthquakes, but hurricanes are a constant concern—70 major cyclones have hit Texas since 1980. Such storms can come ashore as hurricanes.

In August 2017, Hurricane Harvey, a Category 4 storm, battered the city of 2.3 million, causing catastrophic floods and an estimated $125 billion in damage. Glenn Rex, executive director of the Houston Sheet Metal Contractors Association, said no SMACNA members’ businesses were directly impacted by the storm. “Almost all of the damage was to residential and retail establishments,” Rex said.

But that wasn’t the case for 8 to 10 percent of member companies’ employees, whose houses sustained major damage, he added. Even after the storm subsided, it took a week for cleanup efforts to make roads passable. Few evacuees could get to their homes or workplaces.

“Practically all projects were suspended,” Rex said. In some cases, delays were as long as two months.”

The city has had bad weather luck, with flooding occurring in April 2016 and on Memorial Day 2015. Rex pointed out the city has had three once-in-a-lifetime floods in the last three years.

Yet, people sometimes misinterpret such insurance industry phrases as “100-year flood,” McChristian said. It doesn’t mean a flood’s unlikely to happen again for another century, she noted. “A ‘once-in-100-year flood’ means it has a 1 percent chance of happening every year,” McChristian said. “If it happened once, it could happen again.”

**Preparation is Key**

Industry-specific information on sheet metal and HVAC construction businesses is difficult to find, but, in general, insurance experts say that many properties of all types are vastly underinsured.

Research by risk management company ImageCat and CoreLogic Inc., a California analytics firm, estimated that just 10 percent of properties are insured for their true rebuilding costs, with most being underinsured by up to 40 percent, the research found. This is partly due to the ever-increasing costs of labor and materials, and failure to adequately estimate the value of a building’s contents.

Businesses need to ensure they’re prepared for catastrophes by working closely with an insurance agent or broker. “A business owner needs to understand that your agent or insurance broker is a partner that you need to use,” she said. “Have them tour your facility every year and help you to understand what your risks are.”

A lot of different types of policies are available to company owners, she added. A business interruption insurance policy can pay company workers if a disaster means they’re temporarily unable to work. It can also cover the tools and materials in vehicles if the service fleet suffers water damage. Remember most auto insurance doesn’t reimburse a business for possessions stored in cars and trucks, McChristian added.

Insurance is not something an owner can purchase once and then forget about unless they need it.”You really need to have an annual review because your business changes,” she said. “Your risks might change, or you might have made improvements that’ll qualify you for lower insurance (prices).”

McChristian recommended that SMACNA members visit the Insurance Institute for Home and Business Safety at www.DisasterSafety.org to determine what risks they face and how to protect their companies.

A decade after the Cedar Rapids’ flood, Randy Novak has changed his view on preparing for disasters, no matter how unlikely. Novak Heating’s former building was purchased by the city and was sold to a new owner. Novak now has a new facility, which offers room to expand. He also carries flood insurance, backs up his servers to off-site cloud storage networks, and reviews his contingency plan annually. He hopes nobody else has to experience what his company went through.

“I think the best advice I could give is don’t be like me and be underprepared,” he said. “I think the lesson is there is no harm in being overprepared. Whatever level of preparation you’re comfortable with—do something.”

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**Tips on Securing Disaster Recovery Work**

If any good can come out of a natural disaster, it might be the temporary boost in business for construction companies that secure contracts to assist in rebuilding. From federal projects to state and local work, getting hired to help restore battered buildings can bring in significant amounts of income for contractors that secure contracts to assist in rebuilding.

Disasters typically bring many out-of-state contractors seeking work. However, the Federal Emergency Management Agency (FEMA) says its goal is to use local companies whenever possible, www.fema.gov.

FEMA recommends the first step is to contact state emergency management offices, since federal grants can often make up half a state’s rebuilding budget. For a list of offices and contacts, visit www.fema.gov/emergency-management-agencies.

 Contractors should also register with the System for Award Management, a government clearinghouse with a free database of companies registered to do work with the federal government at www.sam.gov. This makes it easier for federal agencies to find companies.

SMACNA members can learn how to register at (866) 606-8220.

More than 41,000 federal work opportunities are currently listed at the Federal Business Opportunities website, www.FBO.gov. Projects seeking subcontractors and team opportunities are regularly updated. Teaming up with a contractor that already performs government work can be a great way to break in to such projects, say many experts.

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Fortunately for Irwin, no one was injured at his facility, although the 1950s building suffered minor structural damage. “We had some storage shelves that toppled over and some tables that moved around,” Irwin added. “It was quickly fixed or moved and we were able to continue on without too much interruption.”

Operating in an area prone to disasters, Irwin said Bell has long had an evacuation plan, but it would never send employees into an area where they might have to be rescued. The company stores critical data off-site in case of an emergency.

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Soldering On: ITI Offers Certification Through JATCs

A renewed interest in soldering certifications has prompted focus on the soldering curriculum offered to SMART members by the International Training Institute (ITI). The ITI provides soldering certifications to workers through their local joint apprenticeship training centers (JATCs).

“Soldering is typically configured.” Harris said. Architectural contractors restoring historic structures would have the most need for certified soldering personnel. If contractors need to train or certify personnel in soldering they should contact their local JATC, he suggests.

Soldering is different from welding in that soldering does not melt the original base metal. Heat is used to bond the material together using solder. In contrast, welding melts both the base material and the additional materials being used to create a weld pool and fuse the materials together.

The ITI also provides an instructor-led soldering curriculum as a self-paced DVD-based program where individuals can study the lessons on their own and work on their soldering in a shop.

Federal Contracting: It’s Not That Different

Federal contracting attorney Edward DeLisle will share his methods for getting government contracts for members who are considering or actively pursuing public work during What You Need to Know When Contracting with the Federal Government at SMACNA’s 75th Annual Convention in San Diego, Tuesday, Oct. 16.

“Federal contracting seems daunting, but it really shouldn’t seem quite so daunting,” DeLisle said.

“There are definitely more hoops to jump through, but it is important from a portfolio standpoint for contractors to diversify. If the economy goes bad, you’ll have that federal contracting work in your arsenal, and, if times get rough, you can do that kind of work without having to learn it for the first time.”

He will go over important aspects of the white paper he is writing for members on federal contracting requirements and practices, including the Federal Acquisition Regulations (FAR), contracting reporting issues, taking part in teams and joint ventures, small business procurement, and contract provisions.

“I provide a roadmap from the beginning to the end of the contract — how you get in, different ways you can be a participant, what happens after you get the project, and what can happen in the middle of a project when things go wrong,” he said.

“It’s really not that different from what you have experienced as a contractor,” he continued. “You just do it in a different space. You treat the owner (the federal government in this case), like you do every other owner.”

Small businesses can benefit too. “Twenty-three percent of all contracts go to small businesses,” he explained. “Billions of dollars are being spent, a lot of money, making a lot of opportunities for small businesses to jump in. If they understand how to team with one another and joint venture with other small and large businesses, it can work out very well.”

The government’s mentor-protégé program is a big piece of contracting as well. “It’s a way smaller folks can begin to work on projects and get into the federal system. Small contractors could find a larger company that has performed federal work and enter into a formal mentor-protégé relationship and they could joint venture with the federal government together. The protégé learns from the larger established contractor on how to do it right and uses it as a tool to expand their portfolio so they are ready.”

In addition to the federal contracting white paper, DeLisle is assisting SMACNA in developing a web page listing federal contracting resources, which will be available on SMACNA’s HVAC web page.

Federal Contractors Must Certify EEO Compliance

The U.S. Department of Labor (DOL) is planning to target federal contractors for audits if they don’t certify their Equal Employment Opportunity (EEO) compliance to the government, according to the Office of Federal Contract Compliance Programs (OFCCP).

This marks a significant change in the Compliance Office’s enforcement efforts. Up until now, EEO audits have been conducted on a random basis.

Currently, federal contractors must disclose to the General Services Administration (GSA) whether they have an EEO plan in place or whether they are not qualified to do so. Contractors make this certification under penalty of perjury and the False Claims Act.

SMACNA contractors working on federal contracts also are not immune from EEO requirements even though they receive their manpower from the union. They still must comply with a number of outreach, recruitment, and training requirements that are separate from their workplace nondiscrimination obligations.

Contractors who fail to meet their EEO obligations as federal contractors can potentially be fined by the OFFCP.

“SMACNA contractors who work on federal contracts must comply with certain equal employment opportunity obligations that may not apply to contractors who don’t work on federal contracts,” said Joyce Blanscett, SMACNA director of labor services and human resource management. “It is important that contractors understand these obligations and the steps necessary to show compliance should they ever be subject to an EEO audit.”

Members can refer to guidance from SMACNA’s Labor Relations Department on EEO Compliance for more on contractor EEO obligations.

Residential

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the way we’re doing things. ‘We also review it with the workers who are out in the field to make sure everyone is on the same page.’

But even his longer-tenured staff calls on the manual sometimes. Katt was recently using the manual and noticed his technicians had highlighted certain sections. “It’s more of a reference tool for when we run into things that are out of the ordinary,” he said. “When we may need to check the span on hangers or look at the structure of certain fittings that are bigger.”

Katt has also used the standard’s text and charts to prove to inspectors that his company’s venting choices were correct. “They don’t always trust me until I start copying and sending them the actual standards,” he said. “So, I’ve done that over the years on several occasions.”

The section on hydronics is especially useful for Seurer’s employees. “We do a lot of boilers. Most training schools don’t cover boilers, especially the design and so forth, so we probably use that one more than any of them with our new people when they come on board,” he said.

Laski added that the manual is a good place for the residential contractor to start, whether they’re bidding a job or already have one. It’s filled with information to help the contractor develop a system and design that will meet the customer’s wants and needs, he noted.

Members may visit the SMACNA Store to purchase the Residential Comfort Systems Installation Standards Manual at smac.news/resid1d106
SMACNA CALENDAR

**OCTOBER 2018**
Oct. 14–17
75th Annual Convention
Marriott Marquis San Diego Marina
San Diego, California

**DECEMBER 2018**
Dec. 2–4
Council of Chapter Representatives
Miami, Florida

Dec. 4
Industry Fund Seminar
Miami, Florida

**JANUARY 2019**
Jan. 27–29
Chapter Executive Institute
Austin, Texas

**FEBRUARY 2019**
Feb. 24–26
Safety Champions Conference
Tempe, Arizona

**MARCH 2019**
March 3–7
Business Management University
Tempe, Arizona

March 12
Collective Bargaining Orientation
Dallas, Texas

March 14–15
Association Leadership Meeting
Dallas, Texas

**APRIL 2019**
April 1–4
Leadership Development Program
Chapel Hill, North Carolina

April 7–10
Project Managers Institute
Raleigh, North Carolina

**MAY 2019**
May 7–9
2019 CEA National Issues Conference
Hyatt Regency
Washington, D.C.

May 10
Safety Surveys Due

May 19–22
Financial Boot Camp
Tempe, Arizona

**FUTURE SMACNA CONVENTIONS**
Oct. 20–23, 2019
76th Annual Convention
JW Marriott, Austin, Texas