DAY 2

TUESDAY | SEPT 12 | 2023

FABTECH
NORTH AMERICA'S LARGEST METAL FORMING, FABRICATING, WELDING AND FINISHING EVENT

SHOW DAILY
THE OFFICIAL FABTECH PUBLICATION

TODAY'S EVENTS

Keynote: A Nasty Bit of Rough with David Feherty
8:30 – 9:30 AM
Lakeside Center Ballroom

LEADERSHIP EXCHANGE
Building the Future Workforce
12:30 – 1:30 PM
Lakeside Center Ballroom

Women of FABTECH
7:30 – 9:30 AM
Room S100C

Careers in Welding Trailer
During Show Hours
Booth B25111

AWS Welding Competition
During Show Hours
Booth B25096

FABTECH Merchandise Truck
During Show Hours
Booth B19111

FABx Tech Talks Ignite Manufacturing Innovation and Leadership Transformation

Yesterday's FABx Tech Talks keynote featured a powerful line-up of visionary leaders who are driving manufacturing forward. They included:

- Carol Reiley, Serial Entreprenuer, AI Robiticist
- Slade Gardner, President, Big Metal Additive.
- Ben Wald, Founder, Very
- Laszlo Gonc, Founder & CEO, Next Era Transformation Group
- Joanna Cooper, General Manager, Mount Holly, Daimler Truck North America

These experts shared insights on the latest innovative trends and technologies that are improving the metal fabrication industry. They suggested ways to transform leadership to drive results. Here are a few of the highlights.

Overcoming the Hype

Anytime a new technology comes along, hype and exaggeration are inevitable. And so it is with rapidly evolving fields such as advanced robotics, AI and 3D printing (also known as additive manufacturing). These technologies may not be able to revive the dead. They do not replace sound manufacturing and fabrication industry fundamentals. Nevertheless, they represent immense value to those who can view their potential with reality.

"One of the biggest challenges is overcoming the hype," said Slade Gardner, President, Big Metal Additive, a metal hybrid additive manufacturing business that provides prototypes, replacement parts and full-scale demonstration articles to address lead time, cost, availability, and design sophistication. "Additive manufacturing is fundamentally a manufacturing capability and these machines do not magically transform casual users into manufacturers."

He emphasized the difference between battle damage repair and reliable rate manufacturing. It is vital to understand what 3D printing, for example, can and can't do and where it fits in the manufacturing spectrum. Some areas of manufacturing will remain firmly in traditional hands. Others, he said, are a good fit for additive manufacturing.

To his mind, factories dedicated to additive manufacturing are the most appropriate places for development, prototyping, manufacturing of first articles, and various production applications. However, the hype has encouraged side projects and incomplete investments toward strategies that underestimate the necessity of the manufacturing support functions that form the backbone of the industry.

Just as businesses have outsourced foundry operations, metal forming and product finishing operations to focused, capable and experienced manufacturers and suppliers, they will begin to demand the same level of dedication and support for additive manufactured products. That means investing in 3D printing equipment at scale and supporting it with the processes and professionalism that are the hallmark of the industry.

"We are planning to be a factory of 100 machines within a decade, producing parts for a wide variety of customers," said Gardner. "There is a manufacturing necessity for investment in additive manufacturing to push the technology to maturity rapidly."

New Technology Brings Risk

Laszlo Gonc, Founder & CEO of Next Era Transformation Group, a team of experienced industry experts that possess deep knowledge and proficiency in multiple verticals. Gonc provides thought leadership on the state of cybersecurity, risk management, threat assessment, the rapidly changing technology landscape, digital careers of the future, and project management leadership. During the panel, he promoted the potential of technological advancements such as AI, extended reality and distributed ledger (blockchain).

"AI is changing the very nature of the material science and metallurgy disciplines, not just the metal fabrication industry," said Gonc. "It is already impacting the research on the composition of metals and how they will be used in the future."

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September 11-14, 2023 / Booths A2104 and B15001

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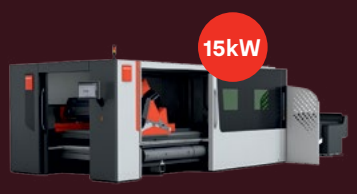

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FABTECH Announces New Event Dates and Locations for 2024 and 2026

Orlando, Florida Added to the Event's Rotation Schedule

The FABTECH event partners announced new event dates and locations for FABTECH in 2024 and 2026. FABTECH, North America's largest metal forming, fabricating, welding, and finishing event, will be held October 15-17, 2024, in Orlando, Florida, at the Orange County Convention Center and October 21-23, 2026, in Las Vegas, Nevada, at the Las Vegas Convention Center.

The decision to relocate FABTECH to Orlando in 2024 was made after careful deliberation by FABTECH show management. FABTECH was originally scheduled for Las Vegas in November 2024; however, the city of Las Vegas is slated to host the Formula 1 Grand Prix Race during the same timeframe in November, with 100,000-plus projected visitors expected to descend on the city. This development makes Las Vegas not optimal to host FABTECH in 2024 as planned. As a result, other viable venue locations were evaluated.

"We are pleased to have secured dates and space in the Orange County Convention Center in Orlando", said John Catalano, SME senior director, events and strategic partnerships, FABTECH. "Orlando can accommodate FABTECH's size and scope and has excellent facilities including a modern convention center with experience hosting large manufacturing trade shows, numerous hotels within walking distance, and a nearby airport easily accessible for U.S. and international travelers."

"The Orange County Convention Center (OCCC) is proud to welcome FABTECH to The Center of Hospitality", said Mark Tester, OCCC executive director. "The event will generate an impressive $90 million in economic impact for our community. We look forward to establishing an impactful partnership that will continue to drive the manufacturing industry forward."

"Orlando is the perfect location for this group of innovators," added Casandra Matej, president and CEO, Visit Orlando. We are excited to work together to create memorable event experiences our destination is known for which includes the amazing attractions, entertainment, and dining options FABTECH attendees and exhibitors can enjoy in our convention district."

The changes in location deviate from FABTECH's regular rotation of Chicago, Las Vegas, and Atlanta. However, according to event partners, these changes to the schedule will ensure a better overall experience for attendees, exhibitors, and all event stakeholders.

"Mitsubishi Laser is excited about the FABTECH move to Orlando in 2024 and look forward to FABTECH's return to Las Vegas in 2026," said Shane Herendeen, national sales manager — fabrication products, Mitsubishi Laser/MC Machinery Systems, Inc. "Orlando offers several appealing factors including the October time frame relative to customer follow-up, proximity of hotels to the convention center, the opportunity to reach a new market, and the ability to anchor our equipment into the show floor, which allows Mitsubishi to bring and operate our latest equipment and automation technology that FABTECH attendees want to see."

The full schedule of locations for FABTECH in the U.S. over the next five years is as follows.

Future U.S. Show Dates and Locations

2024 – October 15-17 at Orange County Convention Center in Orlando, FL

2025 – September 8-11 at McCormick Place in Chicago, IL

2026 – October 21-23 at Las Vegas Convention Center in Las Vegas, NV

2027 – September 13-16 at McCormick Place in Chicago, IL

For more information, visit fabtechexpo.com or follow FABTECH on Facebook, Twitter, LinkedIn and Instagram for the latest event details. ■

Virtual Reality Training Demonstrations Offer Other-Worldly Experience for FABTECH Attendees

There are always plenty of "wow" moments at an event like FABTECH, but few experiences this week will be as memorable as having the opportunity to explore a virtual manufacturing environment. That is exactly what visitors to the SME Zone will be doing when they step up to the Tooling U-SME booth and participate in a Virtual Reality training demonstration.

"It's fun to watch attendee trying our Labs for the first time because we're able to witness the instant they 'get' how virtual reality is a completely different form of learning. Obviously, we can't see their eyes because of the headset, but there's always a moment where they pause and smile," said Chad Schron, senior director, Tooling U-SME. "A large monitor rigged to display what they see in the headset, allows us to watch as they learn."

All FABTECH attendees are invited to visit Tooling U-SME in the SME Zone to try out this new technology. The live demonstrations use inexpensive Meta Quest 2 headsets and hand controls to transport booth visitors straight to the factory floor. Once the device is in place and the user settles into the environment, the learning begins.

Immersive Environment

"We use words like 'immersive' a lot, but when people try a Tooling U-SME Virtual Lab, they realize that VR is enabling them to move around, make decisions, and apply their knowledge inside a fully realized virtual manufacturing environment. It's not just an innovative way to learn; it's an effective way to learn," said Schron.

Tooling U-SME launched its Virtual Labs training just over a year ago to help bridge the gap between learning and doing, utilizing the Applied Learning Methodology of Learn-Practice-Perform. Virtual reality allows trainees to take information they have learned through standard instruction and apply it in a safe environment, performing tasks just as they would in a manufacturing facility. The difference is that when someone makes a mistake in a Virtual Lab, they can simply start over. No expensive tools are damaged, and no additional scrap is created. Not only that, but trainees are able to practice multiple times until they master the exercise: deciding how to solve the problem, choosing the correct tool or device, following the proper steps in the correct order, and coming up with the desired result.

Support for Trainers

Topics covered by Tooling U-SME's Virtual Labs include safety, inspection, electricity, additive, welding, and other areas. Each Lab is supported with a companion Skills Guide which equips trainers with the tools they need to evaluate trainees. The guides include a list of prerequisite online classes which help trainers prepare a task that gages trainees' knowledge and skills in real-world exercises.

For example, in the Fire Safety Lab, trainees are first greeted by their virtual trainer, who gives them instructions before entering the manufacturing space. Once inside, the Lab prompts trainees to find and identify items like fire prevention plans and safety instructions and to locate and properly mitigate various fire hazards. Then trainees are presented with a fire in the manufacturing space. They must identify the cause, choose the correct type of fire extinguisher, and use proper techniques to put out the fire. Afterward, the trainer uses the accompanying Skills Guide to evaluate the trainee's overall knowledge and skills acquired through online and in-person instruction and through the Virtual Lab.

Virtual Training Benefits

As manufacturers struggle to attract, train, and retain skilled a skilled workforce, Tooling U-SME's Virtual Labs provide an effective

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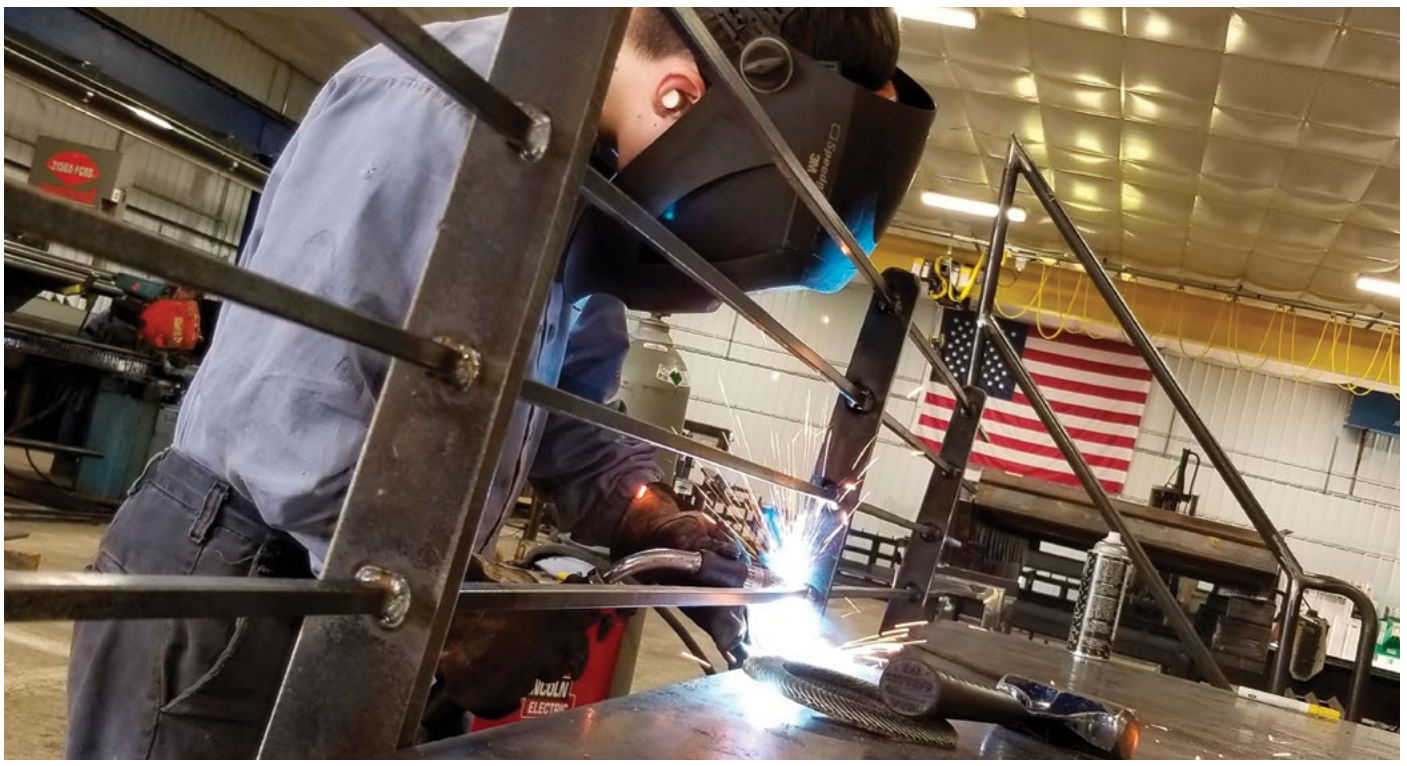
Better Management, Fuller Life

Indiana fabricator launches the ProFab Alliance

by Tim Heston, Published in the May 2023 issue of *The Fabricator*®



Adam Schmitt encourages customers to visit NIX any time. Employees at the Poseyville, Ind., plant have no need to tidy up before a big customer visits.

"I just tell people to walk through our shop. They won't see anyone without safety glasses or smoking at their workstations. They'll see swept floors and organized workspaces. And when visitors get within 10 ft. of anyone, our people stop what they're doing and introduce themselves. When a customer visits, announced or unannounced, it's exactly the same. That's authentic. When customers walk through the door, they understand what NIX is."

A decade ago, NIX had 10 employees. After years of growth, organically and through acquisition, the fab shop is part of an organization that employs 150 people. Since the current owner took over in 2003, revenue has grown by nearly 100 times. Schmitt attributed much of that growth to the company's progressive management system. "Everyone can weld steel. It's really about the culture, the knowledge, and the systems. That's how the ProFab Alliance came about."

Launched in 2022 with Schmitt as its president, the Progressive Fabricator (ProFab) Alliance is in a prototype phase, and about a half-dozen other fabricators have expressed interest. At FABTECH Atlanta held in November, Schmitt presented the concept: an alliance of various metal fabricators united by a shared management system and philosophy.

Consulting, Networking, Purchasing

Better planning allows company leaders to keep work at work. They shouldn't spend their careers juggling chaos and putting out fires. As Schmitt put it, "We want to set people up for growth and allow them to take back their life."

The ProFab Alliance operates as a subsidiary of Nix Companies Inc. (NCI), a corporate group that includes NIX (the original metal fabrication business) along with a marketing company (Captivated Content), a vehicle repair operation, and a commercial real estate company.

"[The ProFab Alliance] falls into two buckets, a purchasing system and a consultancy with networking opportunities," Schmitt said, adding that he envisions alliance members experiencing some combination of those two buckets. He also said that the alliance is still in its infancy. The details of the buying group have yet to be determined, but the management philosophy and system behind ProFab's consulting and networking offerings are very much established.

About Profits, Training, and Accountability

ProFab Alliance's roots go back to a strategic plan NCI managers developed in 2017. "At that point, we created a five-year plan," Schmitt said. "Our owner and president, Matthew Nix, had been thinking about our growth potential for a while. About six of us were sitting around the conference room table when he said, 'I just want to throw this out there. We have the opportunity to grow 100 times in 20 years.'" That is, 2023 revenue could be 100 times larger than it was in 2003. "So, that's when our operating plan came out, and we rolled out that 100X logo to all employees. They knew what it meant."

What happened next reflected a challenge many fab shops face. NCI grew organically and through acquisition. Between 2017 and 2020 it acquired a structural shop and a heavy fabrication and machine

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Leadership Exchange: Trends and Technologies Changing the Future of Metal Fabrication

It's more important than ever for manufacturing companies to focus on new trends and technologies that are changing the landscape of business. Businesses must embrace new technologies and innovations to keep up with customer demands and stay competitive.

So, it was timely that the FABTECH audience was treated to yesterday's Leadership Exchange panel. They shared the latest innovations, trends and technologies that they believe are shaping the future of manufacturing and fabrication.

Harnessing Technology to Improve Welding

Slade Gardner, President of Big Metal Additive, called attention to how additive manufacturing adds to the welding repertoire via wire + arc welding. He said DED-arc is ready for adoption and implementation. This wire-based directed energy deposition technology with gas metal arc welding (GMAW) is supported by safety critical standards.

"The wealth of documentation from ASME, AWS, ASM, SAE, ASTM, Navy and NASA provides engineers multiple options for assembling a technical data package that addresses qualification, inspection and acceptance criteria," said Gardner. "We confidently drive over bridges in vehicles every day, both of which are produced, accepted and trusted on this very technology."

Far from replacing traditional welding, he sees this technology as something that adds to the heritage of the welding profession. GMAW uses a consumable wire electrode and a shielding gas. A welding gun feeds to the joint as part of the arc welding process. The electrical arc that is generated between the wire and the base metal generates heat for melting while the shielding gas protects the molten weld pool from harmful gases. It typically uses a constant voltage and a direct current power source.

Big Metal Additive has also been investing heavily in additive manufacturing technology. The

company expects to ramp up to 30 machines over the next couple of years and from there, Gardner sees a roadmap toward 100 3D printing machines in the future. His company produces four products: prototypes, first articles, low-rate production and full rate production. They have customers in two main categories (i) pressure containing structures and (ii) complex integrated architectures. Many of the pressure containing structures are casting replacements. These can range from valve bodies to propellant tanks to cryogenic vessels.

"The complex integrated architectures are best represented by unmanned vehicles integrated into a unitized structural hull," said Gardner. "Piece parts are reduced, fasteners are minimized and assembly is condensed."

The company works with its customers to demonstrate their concepts with a prototype product that can be tested, evaluated or further developed. Following the prototype, first articles create the digital inventory — a product that includes validated acceptance paperwork and a mature manufacturing readiness that forms the basis for production. Low-rate production and full rate production further mature the manufacturing readiness level, reduce cost per part and improve cycle time.

Gardner combined multi-axis metal deposition and multi-axis CNC machining capabilities on the same equipment. This, he said, opens up all kinds of possibilities for product design and optimization. This was one of the advances that contributed toward scaling up additive manufacturing technology to be able to produce larger parts while maintaining high-quality surface finishes and meeting tight dimensional tolerances. According to Gardner, the five-axis deposition process provides superior isotropic mechanical performance.

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AWS Guide Publications for Welding of Piping and Tubing

Fluids and gases are essential to the operation and productivity of nearly all industrial processes. This can include products, such as gasoline, beverages, or medicines. It can also include materials, such as lubricants, industrial gases, steam, or hydraulic fluids that are used to control and operate machinery for production of many products. Steam, for example, is essential to electric power generation. One of the earliest examples of pipe welding was the joining of discarded musket barrels by William Murdock in 1815 to transport coal gas throughout London for his lamp system. During World War II, welding had moved from a fabrication method that was gaining popularity to one that was essential to the war effort to meet production and performance requirements. The use of welding quickly replaced practices, such as riveting for the construction of many necessary products. Shipbuilding was one area where large movement was made toward the use of welding, and this led to advances in pipe and tube welding. Establishing the AWS D10 Committee More than 70 years ago, AWS recognized the importance of welding to the pipe and tube industry. The AWS D10 Committee was established in 1951 for the purpose of writing recommended practices relating to the welding of piping and tubing for various industries. Its mission statement is the following: "The D10 Committee on Piping and Tubing is responsible for the preparation of standards that formulate safe, sound, and progressive practices for the welding of piping and tubing for all applications. This committee promotes education in the latest welding techniques." The original committee, which consisted of 47 members, was a cross section of American industry. The industries represented on that first committee included oil, gas, power, chemical, aluminum and steel pipe manufacturers, founders, pipe fabricators, engineering companies, welding equipment and consumable suppliers, valve and fitting manufacturers, boiler manufacturers, the American Petroleum Institute, and the U. S. Navy and Coast Guard.

Publishing of Guides The D10 Committee has continued to produce and update recommended practices to meet the emerging needs for knowledge transfer to support pipe and tube welding applications. These documents are now referred to as "guides" and are not considered codes. They are more

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Better Management, Fuller Life

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shop. After all this, the fabricator hit its growth goal a year early, in 2022. It was a time of celebration, for sure, but also a time for reflection.

As Schmitt recalled, "We were transitioning from a high-growth local company to a mature, mid-market organization. We had been in high growth mode for five years. Grow, grow, grow. If we made a mistake, that was fine. Let's keep growing. Last year, though, we knew we needed to slow down. Let's put some new processes in place, and let's get rid of some old ones."

Cleaning House

From this experience came NCI's management and planning system that company leaders hope to become core elements of the ProFab Alliance. The system aims to create a metal fabricator where people want to work, a place where achieving a healthy work-life balance isn't just an aspiration.

The system involves instilling a culture of safety and professionalism. Imagine an employee who's new to manufacturing. He didn't grow up in a manufacturing family; in fact, he's never been on any factory floor in his life. He sees old machines without safeguards, poorly lit workstations, metal parts stashed everywhere—on the floor, in racks. People smoke while operating machines. Hot, uncirculated air hangs over workstations. It's not a workplace to brag about. If the shop produces any marketing material, photographers need to get in close and catch the arcs and sparks. Wide shots aren't very complimentary and, more than likely, reveal safety violations. Managers might say they want to grow and create an employer of choice, but their actions (or lack thereof) say otherwise.

Schmitt is honest, too. A decade ago, NIX's shop floor wasn't what it is today. Some smoked at their workstations. Others didn't wear safety glasses when they should have ("I'm guilty of this too," Schmitt said). The floor wasn't as clean as it should have been.

But that's changed over the years. "It took us a long time," Schmitt said. "You can't force-feed everything, because if you do, it's not authentic. It has to come from the team-member level."

The methodology 5S remains one of the most popular entry points to lean manufacturing, and shop managers have tried all sorts of tactics to instill and sustain a clean shop. Although critical for success, audits and other top-down measures can only go so far. Forcing change just isn't sustainable.

First, cleaning shop can't be a band-aid covering up a dysfunctional shop culture. This is where strategic planning comes into play. According to a presentation Schmitt made at FABTECH, the ideal strategic plan should enhance culture by (1) creating more workforce engagement; (2) fostering transparent communication at all levels; (3) increasing leadership capacity; (4) generating trust and enthusiasm at all levels; (4) fostering broad ownership with accountability; and (5) promoting teamwork in a focused way.

These are lofty goals, for sure, but without action, they lack authenticity and honesty — and being honest starts with the numbers. "It's about being transparent," Schmitt said. "At NIX, we talk about our financials on a regular basis with all team members. With everyone, we go down to the gross profit level. With managers, we talk about net income or EBITDA."

Another set of numbers involves, of course, fair wages and financial incentives. But it's not all about money. Let's be honest, if employees' sole purpose is to make more and more money, they probably wouldn't choose a career in metal fabrication.

Here, the ProFab Alliance borrows from Jim Collins, author of "Good to Great." During his FABTECH presentation, Schmitt asked leaders to identify their core focus, passion, potential for excellence (being the best), and their economic engine (the profits that support a company's passion and potential). The confluence of all three reveals where a company can excel in the long run.

Next comes a company's vision. It might be aspirational, and it might never be achieved fully, but a vision statement acts as a fabricator's North Star. Schmitt gave several iconic examples during his presentation at FABTECH. Walt Disney's vision is "to make people happy." IKEA's is "to create a better everyday life." 3M's is "to solve unsolved problems innovatively."

As Schmitt described, "Is that vision authentic, something true to what the organization is all about, not merely words on paper that sound nice? Would this vision be greeted with enthusiasm rather than cynicism by a broad base of people in the organization? When telling your children or other loved ones what you do for a living, would you feel proud in describing your work in terms of this vision?"

Schmitt conceded that all this might sound foreign, esoteric, and not particularly useful, especially in the ever pragmatic, cut-the-B.S. fabrication business. He added, though, that developing these elements for shop culture is a foundational step that sets a fabricator apart. After all, most fab shops don't work with proprietary technology. Nothing can really stop competitors from buying similar or identical equipment, be it a laser cutting system, a punch, a brake, or a welding power source. The concepts of lean manufacturing—5S, quick changeover, single-piece flow, kanban squares to limit work-in-process—aren't secrets either.

What's missing, Schmitt said, are management systems to attract and retain the right people who can help a small shop grow. The lack of good systems is why some fabricators introduce safety and 5S programs, clean up the shop floor, improve lighting and air circulation, control work in process, shorten changeover times, start documenting processes and amping up training and knowledge dissemination

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TAB Wrap It!

Booth #A-5142

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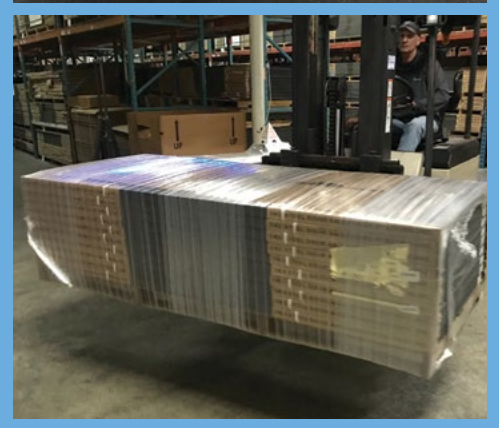

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Robotic Bending System

North American DEBUT

EGB 1303 ARse Robotic Bending System — New electric press brake fully automated, including robotic part handling with auto tool change, to move from part to-part unattended.

North American DEBUT

EGB 6013 ARce Robotic Bending System — New high-speed fully automated electric brake used for small parts. Unattended robotic bending system with auto tool change.

EGB 6020 ATCe Press Brake — High-speed electric Auto-Tool-Change press brake for precise processing of high-mix, low-volume production parts.

REGIUS 3015 AJ (12kW) with Automation and Part Sorting — High-speed, 3-axis linear drive system combined with Variable Beam Control Technology and packed with features to support autonomous operation. Full automation combined with AMTES provides highly-efficient unattended processing, part sorting and tracking.

VENTIS 3015 AJ (6kW) Fiber Laser — Innovative beam control technology creates higher quality cutting by improving surface quality and reducing dross.

HRB 1003 ATC Press Brake w/ Automatic Tool Changer — U.S. manufactured press brake with Automatic Tool Changer, offers great cost-to-performance value. Uses HRB ATC tooling manufactured in the U.S.

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Better Management, Fuller Life

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— only to find chaos returns when things get busy. It's likely because someone dropped the ball: a customer miscommunication, a promise that the shop just didn't have the capacity to deliver on, poor performance on the night shift, a machine maintenance schedule that wasn't kept.

Metal fabrication is a team effort. A star welder might lay down a near-perfect bead that requires little to no grinding. But if that piece is assembled or packaged incorrectly and arrives at the customer as a defective part, what good is that perfect weld? Teamwork is what makes metal fabrication so rewarding, but it's also why finding and developing that team remains so critical.

It starts with the most basic elements, including job descriptions, roles, responsibilities, and expectations. So many small shops operate in that say-no-to-bureaucracy spirit, and, in bootstrapping fashion, do what they can to muscle jobs through. But as revenues and headcounts grow, confusion and challenges arise. An org chart needs to be solidified; responsibilities need to be formalized. This doesn't mean a shop throws cross-training and flexibility out the window. But job descriptions and documented expectations do set up a matrix of responsibility and accountability.

This dovetails into another critical element that the ProFab Alliance promotes: closed-loop management. "Many put strategic plans in place, and they fizzle out," Schmitt said, adding that the main reason they do is the lack of follow up: Was an initiative executed and sustained? "[Closed-loop management] allows managers to stop managing by walking around."

Going to gemba (shop floor walks, seeing where the work takes place) is a healthy practice; serendipitous discovery of waste can be a powerful thing. But it's not a management strategy.

Closed-loop management needn't always deal with complex issues, either. Schmitt described one recent change at NIX that dealt with how delivery trucks were routed through the fab shop's laydown yard. The initiative involved installing signage and informing drivers where to deliver certain materials. "So, how is this going to be sustained? Well, on a monthly basis, we walk the laydown yard and monitor those deliveries to ensure everything is in its designated space," Schmitt explained. "It's that simple."

Beyond this, NIX has a weekly leadership meeting that reviews metrics. "Some are actual, and some are estimated," Schmitt said. "Regardless, the metrics give us a snapshot of what the business looks like. Essentially, [closed-loop] management is about how information disseminates from the executive team to the shop floor, then from the shop floor back to the executive team."

About Time

In recent weeks, NIX has begun finalizing what it calls its Path Program, an initiative that delves into developing career paths for employees. As Schmitt described it, "It's all about asking, 'Hey, what do you want to do in life?' You might be a welder, but you might aspire to be an accountant. We create a road map for them to get there."

The program will build from NIX's existing training programs, one for those aspiring to become company leaders and another (just as significant) for those who focus on the craft of metal fabrication. "We have huge training boards out in the shops," Schmitt said, adding that each create matrices involving people, machines, processes, and technologies. Red signifies someone's a novice at a particular task, yellow an apprentice, green a master. "We have written manuals on what it takes to move from a red to yellow to green, including the required time, effort, and experience."

Schmitt clarified that the ProFab Alliance won't spread identical management programs across different fabricators, be it about training, strategizing, or anything else. Every shop is different, and what works for NIX might not work somewhere else. The goal is for shop leaders to stop chasing the eight ball, focus on what's next rather than what's happening now, and institute a business structure that's scalable.

"It's all about efficiency," he said. "I know all about arriving at 5 in the morning and leaving at 7 at night. Fabricators need to get to a critical mass to start hiring support staff, so that leaders don't have to wear so many hats. We want them to go home at the end of the day have dinner with their family. We want people to live the lives they want to live." ■

Senior Editor Tim Heston can be reached at timh@thefabricator.com.

Nix Companies Inc., www.nixcompanies.com

ProFab Alliance, www.progressivefabricator.com

Leadership Exchange: Trends and Technologies Changing the Future of Metal Fabrication

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Extended Reality Technologies in Manufacturing

Laszlo Gonc, Founder and CEO of thought leadership firm Next Era Transformation Group, named several technologies as playing a vital role in shaping the future of the fabrication industry. As well as AI, he named Extended Reality (XR) as being especially important.

XR follows on from virtual reality (VR) and augmented reality (AR). VR is well known to those who are familiar with Oculus headsets. But it now has industrial applications. Similarly, AR has found wide usage in industry. Maintenance personnel use it to know which valve to check, which part nears end of life, which work order applies to what piece of equipment, and more. They can view real-time digital data on headsets that synch to the equipment in the facility as they conduct their maintenance rounds. Similarly, AR is being used extensively in training. New staff can use it (or VR) to simulate using and fixing equipment without them getting into trouble by damaging expensive equipment. Veteran plant staff can equip newer employees with AR headsets and send them onto the floor. The veteran can pass instructions to them, see what they are looking at and train them on the job.

XR takes things a stage further. Gonc said it can be used for design and prototyping to visualize and manipulate 3D models of parts before they are fabricated. Along with AR, it can be used to enhance quality control by comparing finished parts to a digital twin in real time to identify defects or deviations from its intended design. Instead of 2D blueprints, AR and XR can provide on-site assembly guidance via digital twin views to assist on-site

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FABx Tech Talks Ignite Manufacturing Innovation

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He added that AI speeds up the process of discovering new alloys and optimizing current ones. It helps metallurgists design new metals by predicting their properties faster than traditional methods. It can be used to help create more durable metals by predicting failure points under specific applications. AI can also assist in optimizing resource management in metal extraction and processing, predicting suitable places for mining and improving smelting processes to reduce energy consumption.

In turn, the potential impacts of AI on the metal fabrication industry are significant. With ever more larger datasets being captured, AI can analyze vast amounts of data quickly and accurately, uncovering patterns and relationships that might have been missed by humans. It could be used to simulate complex processes occurring during metal extraction, smelting, and fabrication providing useful insights without the need for costly and time-consuming physical experimentation.

"AI could help researchers, teams, departments, and customers collaborate more effectively with visual tools to not only design components but improve on the processes and workflows," said Gonc. Combined with image recognition technology, AI could be used to monitor the quality of products, identify defects, and improve the overall quality of components and final product designs."

He noted that machine learning is already being used to analyze data from machinery to predict failures before they occur, and thus preventing and reducing downtime. It can also help monitor and create safer working environments, predict and warn against potential accidents, or be used to assist in controlling robotic machinery hazardous for humans to operate.

Technology Brings Risk

Along with vast potential, new technology adds risk. Gonc laid out a variety of risks that these advancements pose. Failures in new technology and related equipment could lead to significant disruption in production. Further, the presence of obsolete technology in manufacturing plants might impact the ability to adopt these new technologies. If adopted, the incompatibilities could potentially lead to breakdowns and disruptions. And in some cases, an overdependence on automation could lead to lack of a skilled workforce to troubleshoot and perform manual repairs when necessary.

"Adopting new technologies will require a substantial investment in worker training and adjustments to existing processes and workflows," said Gonc.

He ended by laying out the many cybersecurity risks posed by new technology. Data breaches may leak trade secrets, designs, and customer information and that has serious consequences. We are already seeing cyberattacks on industrial control systems. This type of risk will exponentially increase with automated AI-enhanced attacks, according to Gonc.

"Ransomware attacks will continue to focus on vendors and suppliers that are part of the critical infrastructure ecosystem, both upstream and downstream," he said. "These attacks are designed to disrupt the supply chain, which include fabricators.

Mother of Robots

The FABx Tech Talks keynote also featured Carol Reiley, a renowned engineering entrepreneur, AI roboticist, and executive. She is on the board of, advising, and/or investing in several companies ranging from AI, healthcare, and diversity. Nicknamed Mother of Robots, she has been working in robotics and AI for more than 20 years. She even became the youngest member elected on the IEEE Robotics and Automation board. During her career she has worked at Intuitive Surgical, Lockheed Martin, General Electric, and Drive.ai.

In her latter role, she developed sensors, cameras and other applications aimed at bringing more intelligence to self-driving vehicles. She cited statistics on the large number of driving deaths and the fact that 94% of them boil down to human error. She worked for several years to find ways to apply AI and robotics to make a significant dent in those numbers. As president of Drive.ai, she helped build team that grew from eight to more than 200+ employees, and raised over $77 million, building partnerships with Lyft, Grab, governments and automotive companies before being acquired by Apple.

"Engineering means problem solving: I get up every day trying to figure out how man and machine to work together to be better than any one of them individually," said Reiley. "We are undergoing a fourth industrial revolution with AI and robotics in the forefront."

She treated the FABTECH crowd to a series of inspirational stories on how AI and robotics are revolutionizing many different fields of human learning. She encouraged the manufacturing and fabrication sectors to invest in these technologies and use them to create a brighter future.

"Metal fabrication companies should invest in research and implementation of automation technologies that suit their specific needs," said Reiley. "Additionally, they should provide training and support to employees to adapt to the changing work environment."

To drive results and remain competitive in an ever-evolving landscape, she added that the manufacturing industry should consider transforming its leadership strategies through using AI in several ways. Being open to adopting advanced machinery, automation, data analytics, and other digital solutions, she said, can enhance efficiency and productivity. AI can be used to check manufacturing quality, document code and in many other ways.

"Encouraging a culture of continuous improvement is crucial for driving results in metal fabrication," said Reiley. ■

Virtual Reality Training Demonstrations

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way to onboard and upskill learners. The benefits of virtual reality training include:

- Lowered Costs
- Improved Safety
- Increased Productivity
- Boosted Retention
- Increased Engagement
- Accelerated Time to Competency
- Improved Ability to Attract the Next Generation Workforce

"When we first started developing our Labs, we assumed this training method would be popular with younger employees who might be more used to VR through experience with gaming—and it has been. However, we've been pleasantly surprised with how well this technology has been received by more experienced, incumbent staff. We purposely chose the Meta headsets because they are inexpensive and offer a low barrier to entry for any size of operation or budget. However, another benefit is that the tech is very easy to use by everyone," said Schron.

For those users who prefer not to use a headset, Tooling U-SME has also developed a desktop version that allows users to experience the Labs on a monitor and navigate the environment using keyboard controls. The tasks and learning objectives are the same, so trainers may use the Skills Guides to evaluate desktop learners similarly to those who use the headsets.

Attendees who would like to try Virtual Labs for themselves should visit Tooling U-SME in the SME Zone, Booth B16000. For more information, go to toolingu.com. ■

Introducing the New Fabricators and Manufacturers Association

Since 1970 the FMA has been at the center of the metal fabrication community through these 4 pillars

Our Association

Shape the future success of our industry within a community that will help shape yours. Be a part of a dynamic network of business and trade professionals dedicated to advancing metal fabrication together.

Our Content

Keep your finger on the pulse of metal manufacturing with The Fabricator, the industry's gold standard for news, insights, and resources. Get informed and inspired by our wide-ranging and impactful multi-platform content.

Our Foundation — Nuts, Bolts, & Thingamajigs

Invest in the future of manufacturing by engaging and supporting our industry's brightest minds. Giving back to the next generation of manufacturing professionals ensures a vibrant future for our workforce and our industry.

Our Trade Show — FABTECH®

Discover what's next and what's new at North America's largest metal forming, fabricating, welding, and finishing event. Find out how the latest technologies, innovations, and products can impact your career or business.

This week we have launched a new bold brand identity that aligns our association with the innovative future of the industry.

We're where thousands of manufacturing professionals unite — individuals, businesses, students — under a common purpose: grow the metal processing, forming, and fabricating industries. To do it, we've built a workforce lifecycle that supports individuals and businesses at every point in their development. Ensure they flourish. Get better at what we do, give back to our community. Expand our skills, our businesses, and our careers. Pave the way forward, with fresh ideas and technologies.

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Introducing the New Fabricators and Manufacturers Association

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What does the future of metal fabrication look like?

We exist to answer that question. It's one we've been pursuing for over 50 years. It's one we keep answering, decade after decade.

It looks like championing new processes, applications, and technologies. Challenging our members — and ourselves — to use their collective expertise for good, often solving complex problems that exist on a national scale.

The future looks like hosting 239 manufacturing-focused camps across 27 states to grow the next generation of manufacturing professionals. Connecting our current ones in meaningful partnerships, so they can share, learn, and grow together.

And it looks like reinforcing to the world how essential the work we do is to a thriving society.

Metal fabrication is going places — toward automation, robotics, AI, new tools and solutions, and more. FMA captures exactly where we're headed in our industry-leading magazine The Fabricator, then it brings it to the fore at FABTECH®, North America's largest metal forming, fabricating, welding, and finishing event. Our strategic partnerships with experts and suppliers, plus a vibrant network of professionals, ensures we're all positioned to lead. At FMA, we highlight innovation, and we inspire it. ■

Conference-at-a-Glance

Tuesday, September 12

TECHNOLOGY	8:00 AM	10:00 AM	12:00 PM	2:00 PM
3D/ADDITIVE MANUFACTURING	**F14:** Business Consideration for Additive Manufacturing Adoption **Room S502A**	NEW! **F15:** Industrial Applications in the Industry: From Part Identification to Quality Mass Production **Room S502A**	NEW! **F16:** Additive Metal Binder Jetting & Post Process Cleaning **Room S502A**	NEW! **F17:** Wire Arc Additive Manufacturing (WAAM) for Automated & Robotic Architecture **Room S502A**
AUTOMATION	**F24:** What to Understand Before Moving Your Shop to a Lights-Out Operation **Room S404BC**	NEW! **F25:** Overcoming Labor and Production Challenges with a New Automation Model that Requires Zero Capital Investment or Overhead **Room S404BC**	NEW! **F26:** Robots Prepare Manufacturers for An Unpredictable Future **Room S404BC**	NEW! **F27:** Automating Weld Inspection & Optimizing Your Weld Automation **Room S404BC**
FINISHING	**C14:** Batch vs. Automated Finishing Systems: Which is Right for You? **Room S253B**	**C15:** See It, Touch It, Fix It **Room S253B**		NEW! **C17:** Powder Performance, Past and Future **Room S253B**
	C24: Choosing the Right Conversion Coating **Room S253C**	NEW! **C25:** Leveraging Liquid Paint Equipment to Improve Quality and Efficiency **Room S253C**		**C27:** Going Extreme with Thermoplastics **Room S253C**
	NEW! **C34:** Technology to Bridge the Skills Gap in Finishing **Room S253D**	NEW! **C35:** Layer Without Limits: How to Choose the Right Protective Coating **Room S253D**		**C37:** Basics of Infrared Curing for Finishing Applications **Room S253D**
FORMING & FABRICATING	NEW! **F44:** Press Brake Automation and Safety **Room S403A**	**F45:** Roll Forming: In-line Punching, Cutoff Dies, and Press Tonnage **Room S403A**	NEW! **F46:** Methodical Troubleshooting - A Step-by-Step Approach to Diagnosing Root Causes Associated with Roll Forming Production **Room S403A**	**F47:** Preventing Dust Disasters: Combustible Dust Safety for Metalworking
	F54: Coil Laser Blanking and Cutting **Room S403B**	**F55:** Machine Safeguarding **Room S403B**	NEW! **F56:** Win More Business, Boost Productivity & Improve Retention in Sheet Metal Production **Room S403B**	**F57:** Advanced Solutions for Tube and Pipe **Room S403B**
JOB SHOP	NEW! **F64:** Tips on DFM - Design for Manufacturing **Room S404D**	**F65:** Estimating and Job Costing in an Ever-Changing Environment **Room S404D**	NEW! **F66:** Hybrid Combination or Breathing New Life into Legacy Machines? **Room S404D**	NEW! **F67:** How to Hire & Train Successful Estimators in 2023 **Room S404D**
LASER	NEW! **F74:** Smart Manufacturing for Laser Technology **Room S502B**	**F75:** Laser Micro Processing **Room S502B**		NEW! **F77:** Laser Surface Modification **Room S502B**
LEAN	NEW! **F84:** Lean Principle: Strategic Planning and Deployment **Room S501D**	**F85:** Lean: Value Stream Mapping: Understanding the Whole - From Sales to Shop to Customer **Room S501D**	**F86:** Lean: A3 Thinking – Developing People & Solving Problems **Room S501D**	NEW! **F87:** Lean: A Case Study: Enterprise Excellence Implementation **Room S501D**
MANAGEMENT	**F94:** Practicing Emotional Intelligence for Workplace Success **Room S402B**	NEW! **F95:** Top 10 Steps to Cybersecurity Safety for You, Your Family, and Your Business **Room S402B**	**F96:** Positioning for Challenging Times & How to Develop Immediate Buy-In **Room S402B**	**F97:** The Art of Managing Workplace Conflict **Room S402B**
MARKETING & SALES	**F114:** How to Drive B2B Organic Growth & Video Tools **Room S404A**	**F115:** Strategies for Improving Close Rates & Quantifying Performance Measurements **Room S404A**	NEW! **F116:** Integrating Marketing & Sales Strategies with Metrics That Matter **Room S404A**	NEW! **F117:** Industrial Marketing Strategies for Machinery & Capital Equipment Manufacturers **Room S404A**
ROBOTICS	NEW! **F124:** Starting Small & Calculating the True ROI for Robotic Investment **Room S401D**	NEW! **F125:** Automation Advances in High-Low Volume Production & Structural Steel **Room S401D**	**F126:** Break Through Autonomous Robotic Solutions **Room S401D**	**F127:** Is Now the Time to Get a Cobot? **Room S401D**
SMART MANUFACTURING	NEW! **F134:** Improve Workforce Recruitment & Retention Through Technology **Room S402A**	NEW! **F135:** Rapid Prototyping for IoT & Cutting Build Cycles for New Product Development **Room S402A**	NEW! **F136:** The Simulation Equivalence Principle: Optimizing Operational Strategy with Digital Twins **Room S402A**	NEW! **F137:** Digital Factory: Simulation & Visualization to Predict Production's Future **Room S402A**
STAMPING		NEW! **S15:** Processing Parts for Progressive Dies Part 1: Engineering Principles and Design Guidelines **Room S501A**	NEW! **S16:** Processing Parts for Progressive Dies Part 2: Evaluating Strip Layouts **Room S501A**	NEW! **S17:** Building a World-Class Tooling Information System **Room S501A**
		S25: Maximize Your Lubricant Performance – Safety and Reuse **Room S501BC**	**S26:** Lightweight Sheet Metal for Automotive Industry **Room S501BC**	NEW! **S27:** Smart Production and Smart Engineering - A Winning Combination **Room S501BC**
WORKFORCE DEVELOPMENT	NEW! **F144:** Don't Let Technology Disrupt Your Culture or Your Team **Room S401BC**	NEW! **F145:** Employee Recognition: Appreciating Your Manufacturing Workforce **Room S401BC**	**F146:** Five Steps to Creating a Successful Career Pathing Program in Your Company **Room S401BC**	**F147:** What You Need to Know and Do to Attract the Right Talent and Skills to Your Company **Room S401BC**

WELDING	**W3:** AWS/Weld-Ed Conference: Welder Certification **Room N227B**	8:30 AM – 4:00 PM
	W4: Stainless Steel Welding and Applications of AWS D1.6 **Room N230AB**	8:00 AM – 4:00 PM
	W5: Weld Engineering for the Non-Engineer (Engineers Welcome Too) **Room N231**	8:00 AM – 3:00 PM
	W6: The History & Evolution of GTAW **Room N128**	10:00 AM – 12:00 PM
	W7: Railroad Rail Welding - Applicable Joining Methods **Room N129**	10:00 AM – 3:00 PM
	W11: Professional Program - Day 2 **Room N138-N140**	8:00 AM – 5:00 PM

Schedule subject to change. Detailed Conference Program session descriptions, speakers, pricing, room locations and more can be found at **fabtechexpo.com/conference**.

Basic Intermediate Advanced

Leadership Exchange: Trends and Technologies Changing the Future of Metal Fabrication

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teams in assembling the structures accurately, especially large-scale designs, said Gonc. "The impact in training and education can be significant, with workers being trained in a fully immersive, virtual environment," he added. "Instructors from around the world can interact in real time."

In addition, machine learning is already being utilized to help technicians predict maintenance and repair schedules. With XR, technicians can overlay digital instructions or schematics onto physical equipment. This approach can guide them through complex maintenance tasks or troubleshoot problems.

Blockchain in Manufacturing

How about distributed ledger (DL) or blockchain technology? Gonc believes it will eventually be used to track every aspect of the supply chain — from the mining of raw materials, processing, deliveries to vendors and suppliers, component fabrication itself all the way through to delivery of final products to customers.

"Imagine failures tracked down to the origination points of the raw materials themselves," said Gonc. "DL can provide provenance — custodial history — throughout the entire supply chain ecosystem. After customer delivery, DL could be used to gain operational data in different environments with IoT sensors to provide real-time, real-world feedback to improve components in addition to maintenance and repair scheduling — even replacement — scheduling." ■

Located off the Lakeside bridge, the **FABTECH Back Lot** is the place to be for food, fun and friends. Head to the Back Lot to grab a drink and bite to eat from a variety of food stations.

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AWS Guide Publications for Welding of Piping and Tubing

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prescriptive than codes, providing practical information on welding processes and procedures compared to the rules and requirements found in codes. However, it is very noteworthy that many codes that address pipe welding requirements cite D10 guidelines as informative references. The D10 publications are beneficial as a resource for experienced engineers to provide emerging welding engineers with practical knowledge of welding processes and practices used for pipe and tube applications. The expansion of the D10 guides has been focused on keeping up with new materials and welding technology. Several publications are in development and provide excellent opportunities for individuals to share their knowledge and be involved in the development of new guides. The first of these is D10.21M/D10.21, Guide for Welding Creep Strength Enhanced Ferritic Steel Piping and Tubing, which addresses creep strength-enhanced ferritic steels (CSEFSs) to meet the need for a document that is specific to welding of these materials and how they obtain and maintain properties.

The use of the filler metals specific to these alloys will be addressed, including their influence on the final properties of the completed weld. The importance of preheat and postweld heat treatment when welding CSEF materials identified a need to formally address the qualification of personnel performing these operations. Another new document, AWS D10.23M/D10.23, Specification for the Qualification of Personnel for Local Heat Treatment of Piping, Tubing and Components Using Electric Resistance Heaters, is being prepared to address this need. Conclusion When faced with challenges in pipe or tube welding, the D10 publications can provide a practical, quick, and economical resource to solve many welding-related issues. To access any of the D10 publications, visit aws.org and click the “Bookstore” tab. This is your entryway to a vast amount of useful information that can help reduce cost and time for your welding applications. WJ SHANE FINDLAN (findlas@westinghouse.com), PE, IWE, is consulting engineer, welding and materials engineering, Stone & Webster LLC, Rock Hill, S.C., and chair of the AWS D10 Committee on Piping and Tubing. WILLIAM F. NEWELL, PE, PEng, IWE, is vice president, engineering, Euroweld Ltd., Mooresville, N.C., and past chair of the AWS D10 Committee. ■

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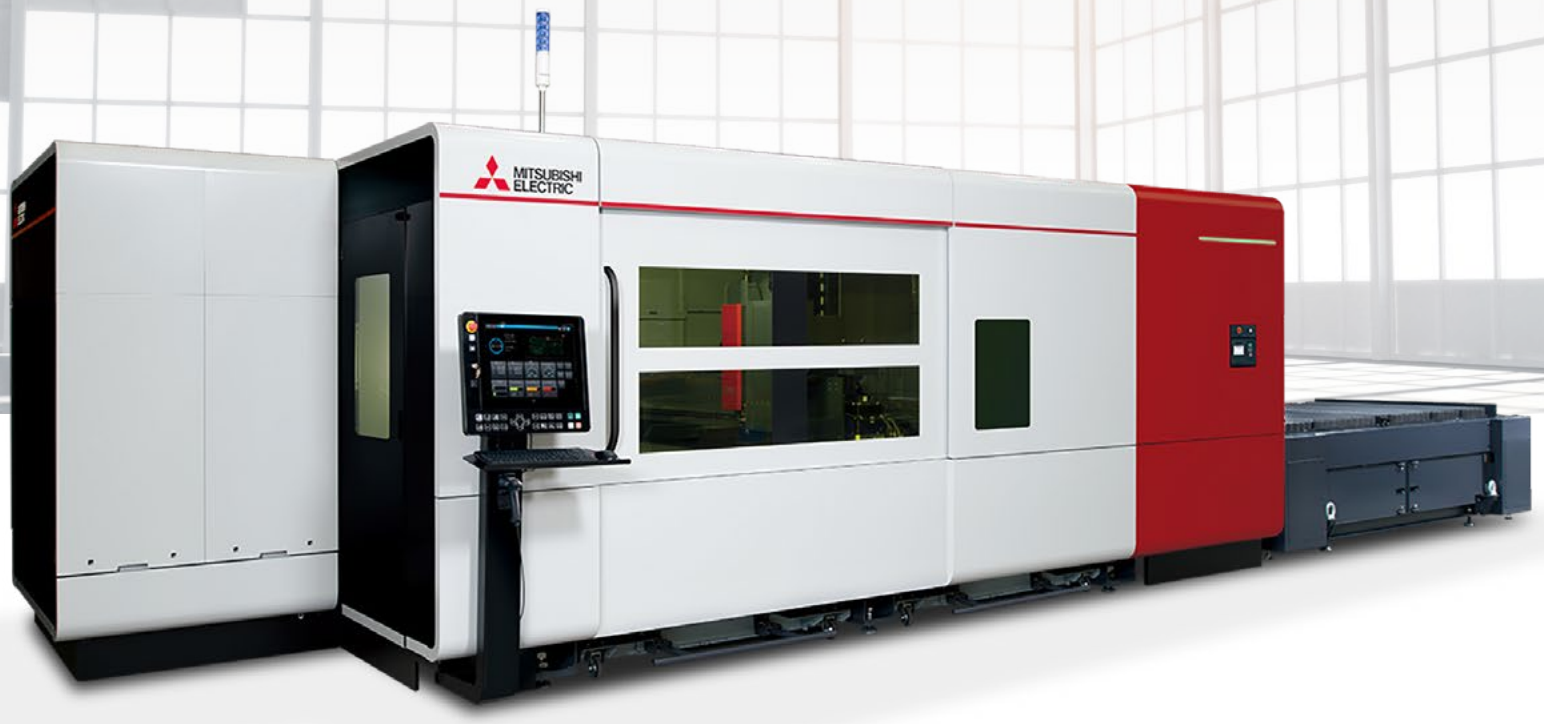

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