THE RECORD

MAY 2018

PUBLISHED BY THE NATIONAL TOOLING AND MACHINING ASSOCIATION

AUTOMATIC SUCCESS?

Human-Robot collaboration and the future of manufacturing

Inside this issue

75 YEARS MADE STRONG

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MANUFACTURING AMERICA'S FUTURE

2018 EVENTS

LEARNING

Software Bootcamp • Cleveland, OH • May 10—11

Big Hairy Audacious Growth Conference • St. Louis, MO • June 6—8

Emerging Leaders Roundtable • Nashville, TN • August 22

Plant Managers Roundtable • Cleveland, OH • September 24—25

Financial Managers Conference • Dallas, TX • November 7—9

GLOBAL

Japan Tour • Japan • April 22—28 ✓

NETWORKING

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✓ MFG Meeting • Miami, FL • March 7—10

✓ Emerging Leaders Conference • Pittsburgh, PA• April 30—May 2

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75 YEARS MADE STRONG

NTMA NATIONAL TOOLING AND MACHINING ASSOCIATION

75 YEARS OF MANUFACTURING SUCCESS AND EXCELLENCE

In 2018, the National Tooling and Machining Association is celebrating our 75th Anniversary. We'll share stories, information and the history of the organization throughout the year. Do you have something that you would like to share? Please contact Kelly LaMarca at klamarca@ntma.org with any stories, photos or ideas. We look forward to celebrating our diamond anniversary together!

NTMA WELCOMES NEW MEMBERS

AC HENRY COMPANY, INC.
Pittsburgh Chapter
Carl H Baxter
1718 Penn St.
Huntingdon, PA 16652

AIR MANUFACTURING INNOVATION - NIKE, INC.
General
John Botts
13630 SW Terman Road
Beaverton, OR 97005

ANDCO MANUFACTURING
Northwestern Pennsylvania Chapter
Andy Anderson
13748 Broadway Drive
Meadville, PA 16335

CLEVELAND ELECTRIC LABORATORIES - ADVANCED TECHNOLOGIES GROUP
Arizona Chapter
Rodger Shepherd
361 S 52nd Street
Tempe, AZ 85281

COSMODYNE MANUFACTURING, INC.
General
Richard Lopez
9904 Cochiti Rd SE
Albuquerque, NM 87123

SPEEDGRIP CHUCK COMPANY
Michiana Chapter
Allen Boehnlein
2000 Industrial Pkwy
Elkhart, IN 46516

NTMA

PRESIDENT'S UPDATE

DAVE TILSTONE / NTMA PRESIDENT

The May edition of the Record is devoted to robotics. Ten years ago, if anyone suggested that small- to medium-sized manufacturers would be using robots to the extent NTMA members are using them today, I would have argued to the contrary. Why? My observations and conversations with NTMA members provide some valuable insight. Through the National Robotics League (NRL), the NTMA has introduced students, parents and educators to our industry. The innovation of industrial robots and those built by students for the NRL is shaping the future of our industry and the perspective the general public has with our industry.

Robots have been utilized for many years in production environments for high volume material handling applications, welding, painting, assembly, as well as thriving in dangerous environments. Most of these applications aren't common place in member shops, so why are members buying them? For the most part, robots have become integral to a successful automation and machine utilization strategy. I attribute and credit much of the adoption of robots by NTMA members to the leading robotics companies. Programming robots has become much easier, they are more economical to purchase, are more versatile and as a result provide a high return on invested capital. Utilization of robots enables members to run their machines in a "lights out" untended mode during normal work hours, but they make it possible to produce parts during the evening and on weekends, too.

They are also an excellent replacement for the mundane and repetitive jobs, thus freeing up valuable human capital. This is especially important with our skilled labor shortage. Robots aren't replacing jobs, per se, but are providing an opportunity for your employees to spend more time on value-added tasks.

I sometimes hear that robots can only be justified for high volume production, so they are "not a good fit for my shop." Our most recent Tech Tour to Japan would prove this statement to be false. In fact, NTMA members that joined the Japanese Tech Tour were not only impressed with the extensive use of robots at Okuma, but amazed. Okuma's Dream Sites 1 and 2 are two of the most advanced manufacturing facilities you'll ever visit. Robots are integral to their lean strategy of producing low volume, high quality machine components. While visiting Big Daishowa (parent of Big Kaiser), their tooling production facilities employ over 200 robots for lot sizes ranging from 30 to 200 pieces for their 20,000 catalog products.

Robots are very intriguing and interesting to students and young adults. The NRL provides a platform for students to explore robotics and utilize their innovative thinking and STEM training. The NRL National Competition takes place on May 18-19 in California, PA, with over 600 students expected to compete with sixty 15-pound bots. You'll often hear students say that they would never have been exposed to manufacturing or pursued a career in manufacturing had it not been for the NRL. The competition is exciting, challenging and attracts some of the best students to our industry. As we continue to expand the NRL, it takes resources and commitment. Tamasi, the Chairman of the NTMA Workforce Development Board,

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THE RECORD

OPERATIONS & EDITORIAL
Dave Tilstone, President
Molly West, Editor

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PRESIDENT'S UPDATE CONTINUED

has generously dedicated his time and leadership to the NRL for past several years. He has supported the NRL competition with a $10,000 gift again this year. I am also pleased to announce that the alliantgroup is the new Innovation Award Sponsor for 2018 and 2019. The alliantgroup is best known to NTMA members for their expertise and services they provide for the R&D Tax Credit. Since becoming a partner of the NTMA in 2017, they have identified tax credits exceeding $33 million for our members. Their commitment to supporting STEM education and manufacturing in the U.S. comes from their CEO, Dhaval Jadav. Dhaval and his team are also leading the efforts with the help and support of Bill Padnos to establishing NRL teams with local Houston schools where their headquarters are located. The future is bright for the NRL thanks to the help and support of our sponsors, our volunteers, our chapters and our members.

Enjoy this edition of the Record and I encourage you to consider how robotics could become part of your business strategy.

DAVE TILSTONE / NTMA PRESIDENT

IS A COLLABORATIVE ROBOT RIGHT FOR YOUR APPLICATION?

By Gregory Buell, Collaborative Robots Product Manager, FANUC America

As the product manager for FANUC's CR Series collaborative robots, customers often come to me for a review of their operations, asking for guidance in application areas where they feel a collaborative robotic solution may be an ideal choice. I find these reviews to be very interesting, as they provide insight on how engineers in the manufacturing and research sectors are utilizing collaborative robots in real-world applications and production facilities.

During an automation review, I ask the customer to consider if the application will require frequent interaction between the robot and the operator in the manufacturing space. If that is the case, then there is a compelling reason to implement a collaborative robot system, which offers significant benefits including enhanced efficiency and productivity. Surprisingly, customers often respond that management has mandated that a collaborative solution should be integrated somewhere in the facility. That response speaks to the popularity of this industry-changing technology, but it may not always be the best use of production efficiencies or financial resources. I've found that six years after the update to the RIA 15.06 safety standard, where the specification and use of collaborative operation was released to the industry for digestion, there is still some confusion as to what a collaborative robot is and where they are best used. So, let's take a deeper look at RIA 15.06.

COLLABORATIVE "SOLUTIONS"

When we talk about collaborative robotics at FANUC, we're not only talking about FANUC's green CR Series collaborative robots. There are other solutions FANUC provides that allow for safe interaction between a FANUC robot and the operator in a robotic work cell. In fact, the RIA 15.06 safety standard describes four types of collaborative operations that robot manufacturers can provide. Currently the most popular type – and the type most people think of when they hear collaborative robot – is Power and Force Limiting Robots. This type of collaborative robot operation requires the robot to have the ability to limit power and force by inherent design or control, or put more simply, the robot stops when it comes into contact with a person or object. Although power and force limiting is currently the most conventional of the four cobot operations, many applications can effectively employ the other three types as well. This can even include using more than one type of collaborative operation within the same automated cell. Keep in mind, the typical machine tending system consists of more than just a robot, so there may be tooling, machines, and possibly conveyors that will all need to be evaluated

for hazard mitigation. Determining the appropriateness of collaborative operation - as well as which type to use – comes down to fully assessing and understanding your automation needs.

DIFFERENT TYPES OF APPLICATIONS

For example, a machine tending application can be set up a number of ways, but the three most common are:

- Traditional, standard fenced system
- Fenceless configuration using speed and separation monitoring for collaborative operation
- Power and force limited robot

Making the best choice between the three options requires consideration of how the space is being used. The traditional system would most likely result in the highest throughput, with the robot operating at the fastest speeds. However, access to the system/machine would have to be through a standard safeguarded fencing gate. If frequent access is necessary throughout the production shift this can result in a considerable amount of idle time. It's hard to pay the bills if the robot is not making product.

That's where the benefits of a collaborative system come in. A fenceless solution using speed and separation monitoring with safety-rated area scanners allows the manufacturer to take advantage of the speed of a traditional robot while realizing the benefits of a safe, collaborative workspace.

This would allow easier access for operators - slowing and stopping the robot applicably as the operators perform their tasks – and returning to high-speed operation when the person vacates the collaborative area. The initial cost of building a fenceless, collaborative configuration using speed and separation monitoring will likely be higher than a standard fenced system, as safety-rated area scanners often carry a higher price tag than fencing. Additionally, more time will be necessary for programming (scanners and robot) and for risk assessment. However, this option allows for access to the system and the higher speeds of a traditional robot, resulting in reduced downtime and thus, higher throughput and productivity.

Finally, using a Power and Force Limited robot for the system allows for the robot to continuously make product even if the operator is standing next to it. Although Power and Force Limited robots are generally speed restricted for safety, this can be mitigated by the efficiencies gained when allowing workers to freely enter and exit the cell without stopping the

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TURNING AWARENESS INTO ACTION

By Bill Padnos, NTMA, director of Youth Engagement

On May 29, 2018, Starbucks will be closing its 8,000 company-owned stores in the United States for one afternoon to educate employees about racial bias. 175,000 workers will participate in this unprecedented move by the company CEO Kevin Johnson in response to the arrest of two black men who were waiting for a friend at a Philadelphia Starbucks in early April. Mr. Johnson said in a statement, "I've spent the last few days in Philadelphia with my leadership team listening to the community, learning what we did wrong and the steps we need to take to fix it."

The store closures on May 29 will cost the company an estimated $12.4 million in lost sales. However, could you imagine if Mr. Johnson did not take personal responsibility and action? I am sure that Starbucks lost some customers over this incident, but in the long run the company likely avoided massive boycotts and protests.

Everyone has unconscious bias. This does not make us bad; it only makes us human. Even if every company in the U.S. shut down on the afternoon of May 29 for training, we would not be able to completely rid ourselves of unconscious bias. We would be able to learn how to recognize it and lessen its impact in the workplace. Everyone can learn these skills.

I am not calling for all NTMA members to shut down operations on May 29 and hold an afternoon of training. Instead, take a moment to make yourself aware of how your unconscious biases are affecting your behavior. If they remain unchecked, they can have an enormous impact in the workplace and throughout

SEE "STARBUCKS" NEXT PAGE

"STARBUCKS" CONTINUED

your everyday life. Unconscious bias causes people to unintentionally favor some groups—often ones that are like them—over others. This can lead to differences in who gets hired and recruited, who gets offered new opportunities, and whose voice is listened to.

Understanding and mitigating the impact of unconscious bias is a crucial leadership skill. With awareness of unconscious bias and actionable steps to manage it, you will be able to make the best decisions for your company, your colleagues and your work team. Managing unconscious bias is a vital step in building workplaces that are innovative, dynamic and inclusive.

Marc Benioff, the founder, chairman and CEO of Salesforce, revealed on 60 Minutes that the company has spent $6 million on pay raises for women over two years to ensure equal pay for equal work. Initially, he did not believe that his company was paying women less for the same work. When he saw the data, he acted. When he saw the data again after a series of company acquisitions, he acted. Mr. Benioff also realized that high-level company meetings had little to no representations from women. He implemented a new policy that meeting attendance must be at least a third female. This did not mean that Salesforce had a sudden increase of women in leadership positions, it meant that the company spent the time to identify who the high-potential women were and opened the door for them to have the opportunity to be invited to those meetings.

Mr. Benioff believed that his company treated all of its employees equally. When confronted with the facts from an internal audit, he realized that action needed to be taken. As you spend time conducting your own personal audit, recognize the work that needs to be done within your company to take action and manage bias. Create an action plan with speciifc, measurable goals that will help you to build and sustain inclusive workplaces and turn diversity into a strategic business advantage.

NTMA

"FANUC" CONTINUED

robot. Additional efficiencies include floor space savings, reduced capital equipment costs, and easy redeployment by eliminating the need for fencing. In my experience, FANUC's green CR Series of Power and Force Limited collaborative robots have proven to be a safe, effective and reliable solution for a great number of manufacturers whose first priority is to have a continuously operating shared workspace between people and robots.

CONCLUSION

What does this all mean? In the big picture, a collaborative robot's effectiveness, as with any piece of automation, depends on how well it performs the task it has been set up to do. Often times it is best to set up a comparison grid for the different types of collaborative operations, showing the advantages and disadvantages of each one. Researching the correct form of collaborative solutions for your application will ensure maximum effectiveness; I always recommend working with an experienced partner to help guide you in the process. Finally, a thorough understanding of collaborative operations will help engineers determine the best use for each unique scenario resulting in successful implementation of your system.

NTMA FANUC

GETTING TO KNOW ONE OF NTMA'S FOUNDING FATHERS: ED HARDMAN

Contributed by Kelly LaMarca
Membership & Chapter Support Specialist

Upon high school graduation, Mr. William Edward (Ed) Hardman, an honors student, had to put off college to work and support his mother. He held a variety of jobs including one as a machinist for the Marlin Firearms Company. World War II had broken out, and at the age of 23 he enlisted in the United States Navy and served as Chief Petty Officer aboard the aircraft carrier U.S.S. Marcus Island in the Pacific engaged in heavy combat activity against the Japanese Navy. Hardman was in charge of the aviation ordnance group on the flight deck. The ship received the unit citation for efficiency and valor under enemy fire, participating offensively in six major invasions and sea battles including the battle of Leyte Gulf, the world's largest sea battle.

After the war, Hardman held several jobs and owned several businesses including a tavern in South Glastonbury, Connecticut and a service station in Manchester, Connecticut. During this period he also attended the University of Connecticut on the G.I bill, where he graduated in 1952 with honors and received his Bachelor of Arts Degree in English. In 1953, he went to work at Pratt and Whitney Aircraft, in East Hartford, Connecticut, where he served as a training instructor teaching advanced math to machinists engaged in the manufacture of jet aircraft engines. In 1956, he became Supervisor of Training Instructors at Pratt and Whitney. In 1961 Hardman left Pratt and Whitney to assume the job of Director of Training for the international typewriter and business machine manufacturer Underwood-Olivetti in Hartford, Connecticut. He devised and introduced several innovative training procedures which resulted in increased manufacturing quality as well as reduced production costs for numerous company products. In 1963 the corporation received the Training Award of the Year from the American Society for Training and Development. Also, while at Underwood Olivetti, Hardman wrote his first technical book entitled "*In Plant Training*", Prentice Hall, which was widely read and utilized in the manufacturing world, and remained in print well into the 1980s.

In March of 1964, Hardman became Director of Training for the National Tooling and Machining Association in Washington, D.C. In his first year at NTMA, he authored three publications that were used nationally by toolmakers and machinists: "*Blueprint Reading for Toolmakers*", 1964, NTMA, Machine Theory, NTMA, and Mathematics for the Machine Trades, NTMA. In 1966, he became President and Chief Operating Officer of NTMA, a position he held for the next 20 years. Under Mr. Hardman's leadership, NTMA grew from an organization of 700 members to over 4000 member companies. He developed and managed the largest skills training program in the country placing 17,000 previously unemployed persons in skilled jobs nationwide. Hardman had developed a national reputation for expertise in small business manufacturing and skills training.

Ed Hardman was also known on Capitol Hill as a powerful lobbyist for skills training as well as other programs and fiscal incentives to assist the growth of the tooling and machining industry. In addition, Ed Hardman was a frequent visitor to the White House in every administration from Johnson to Reagan. In 1966 President Johnson appointed him to a task force to recommend improvements in vocational training. In 1971, at the personal request of President Nixon, Hardman led a trade mission to the Soviet Union, resulting in considerable business for the tooling and machining industry. In 1974, President Ford appointed him to the Small Business Advisory Committee of the Internal Revenue Service. President Reagan, in 1983, appointed Hardman to the National Advisory Council on Vocational Education. He was regarded inside the industry and out as an excellent writer and powerful speaker, and as an authority on the history of manufacturing and manufacturing techniques in the United States and abroad. He was a tireless advocate for small business manufacturing and skills training in America. He also served on the Board of Directors of the International Special Tooling Association, headquartered in Frankfort Germany, representing tooling and machining associations from 14 western world countries. Hardman retired from NTMA in 1986. On April 19, 2011, William Edward Hardman died at the age of 92 of complications from multiple health issues at Anne Arundel Medical Center in Annapolis, Maryland. In his honor, NTMA's Board of Trustees established the William E. Hardman Award for excellence in training. The award is presented annually to the tooling and machining company judged to have done the best job in skills training.

Event Highlights & Features

June 6: St. Louis Cardinals game and presentation by a St. Louis Cardinals marketing executive

June 7: Full day of educational sessions and a plant tour of the Anheuser-Busch Brewery

June 8: Half day of educational sessions and an open roundtable discussion

Event Topics

A Self-Test: Assessing Your Own Marketing Effectiveness
NTMA Member Panel: Best Practices for Sales, Marketing and Diversification
How to Differentiate Against Your Competitors
Panel Presentation: Growth Behaviors of Top Shops
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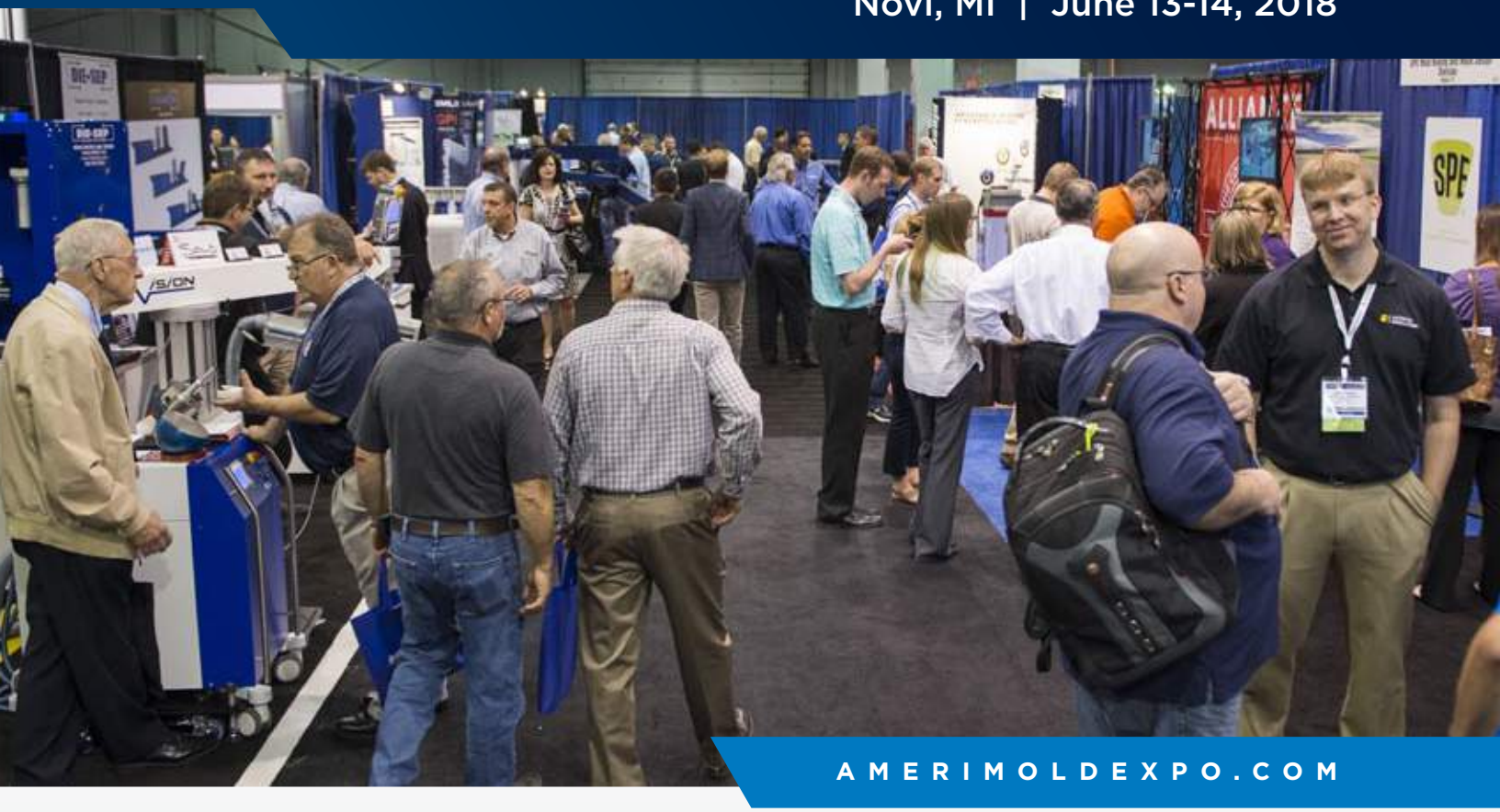

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AMID TARIFF TALKS, ONE VOICE MEMBERS MAKE ADVOCACY TRIP TO CAPITOL HILL

By Caitlin Andrews, director PRG, Bracewell LLP

Approximately 75 NTMA and PMA members participated in the 10th annual One Voice Legislative Conference in Washington, DC in April. Attendees marked a decade of advocacy action on Capitol Hill by visiting over 110 congressional offices during their two days in Washington. Participants also enjoyed sitting down to lunch with members of Congress to talk in more informal settings.

The trip, a highlight of the One Voice advocacy efforts in Washington, is a unique opportunity to meet with the elected officials and integral staff members whose decisions impact NTMA member businesses.

In the meetings this year, NTMA members expressed enthusiasm for the passage of the recent tax reform bill, which provided the largest tax cuts in over thirty years. Importantly for One Voice members, this legislation secured a 20 percent deduction for pass-through businesses such as S-Corporations and provided full 100 percent business expensing which enables manufacturers to invest in machines, property, and training.

Relatedly, attendees also applauded Congress' commitment to boosting manufacturing sector workforce development initiatives. A large majority of One Voice members consistently report both having open positions and having difficulty filling those jobs, and Congress is taking action to address that issue. For example, the House has unanimously passed a Career and Technical Education bill and, in the Senate, a bipartisan bill to allow grants for short-term skills training has been introduced. Attendees asked Congress to keep up the good work by pushing these and other pieces of legislation forward to promote careers in manufacturing.

This year's trip came at a critical time, in the wake of the Trump Administration's recently announced tariffs on imported steel and aluminum. Attendees called on Congress to maintain their support for the U.S. manufacturing sector by weighing in with the White House and asking that the tariffs be lifted as quickly as possible. One Voice members explained that tariffs on imported steel and aluminum raise the prices for both imported and domestic raw materials by making the U.S. an island of high steel and aluminum prices. As a result, attendees warned, the finished parts that downstream users make may simply be made overseas and imported into the United States.

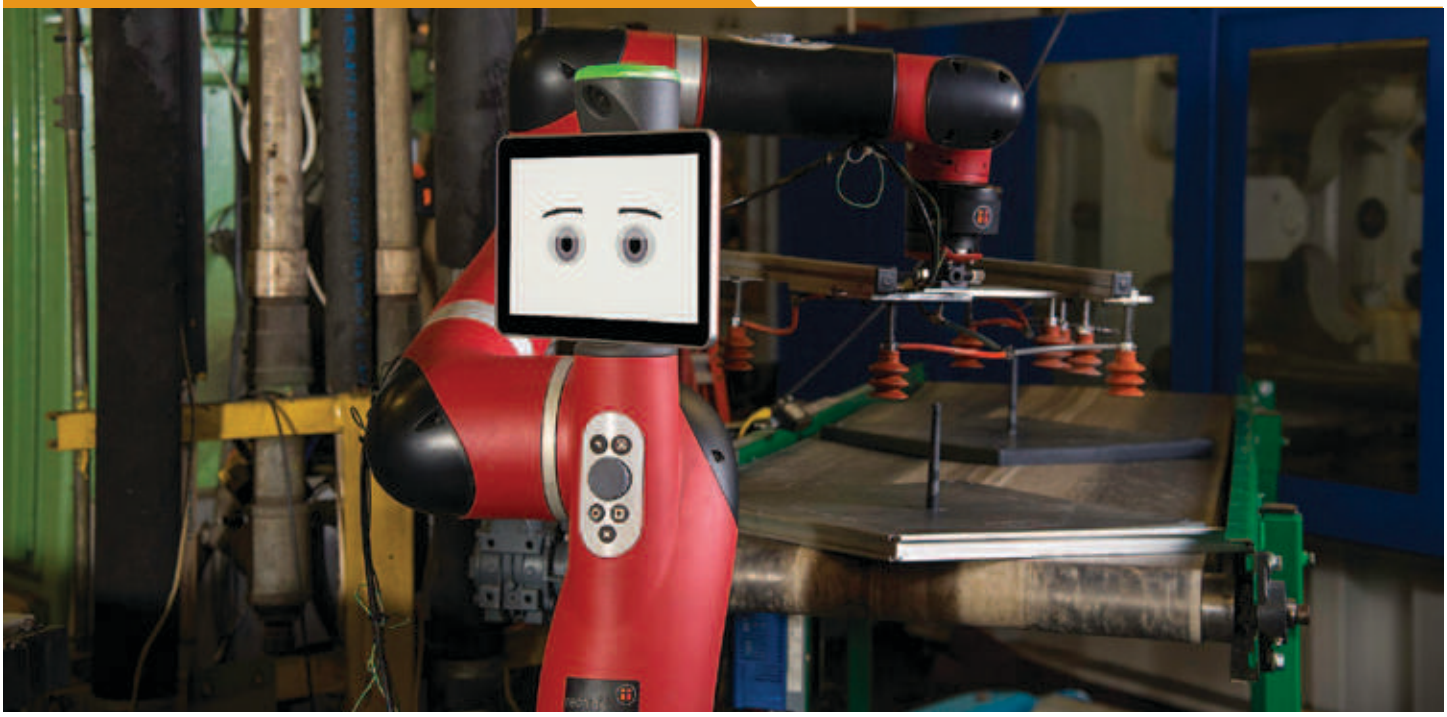
One Voice members also took their "take caution" message on tariffs off the Hill and into the media. Many attendees were able to participate in the official launch of a new coalition of U.S. businesses and trade associations representing over 30,000 companies and over one million American workers in the manufacturing sector and in the downstream supply chains of industries including aerospace, agriculture, automotive, consumer goods, construction, defense, electrical, medical, and recreational, among others. The Coalition of American Metal Manufacturers and Users, of which NTMA is a member, kicked off with a press conference at the National Press Club on April 18, 2018. Speaking at the event, One Voice member Troy Roberts said:

"These tariffs are extremely counter-productive with respect to the progress made these past few years. The Administration did some great things. The tax cuts were a welcome development that were required to make the US corporate tax structure globally competitive. Business conditions in the United States have improved. We're seeing overdue regulatory reform and a focus on apprenticeships and workforce development. But now, the Section 232 tariff's impact on the cost and delivery of our most basic inputs are making us non-competitive."

The One Voice Legislative Conference is important because it offers a unique opportunity to remind Washington of the real-world consequences of legislation and regulation that are felt in facilities across the country.

Planning is already underway to ensure that next year's gathering keeps up the message to Washington that manufacturing matters. Remember that NTMA members can give unlimited corporate or individual contributions to the NTMA Government Affairs Administrative Fund which supports the work done by The Franklin Partnership and Policy Resolution Group at Bracewell LLP. Additionally, NTMA members can make limited personal donations to the Committee for a Strong Economy (CFASE) PAC, which supports pro-manufacturing Congressional candidates.

Manufacturers have a lot at stake, and to make a difference in Washington, those who know the industry best have to participate in the process. Keep up with One Voice advocacy efforts and find ways to get involved on the One Voice website - www.metalworkingadvocate.com - and by following @onevoiceformfg on Twitter.



PEOPLE WILL ALWAYS HAVE A PLACE IN MANUFACTURING

By Stacey Schroeder, NTMA, director of Workforce Development

Automation has been happening around the world for quite some time, and isn't stopping any time soon. According to McKinsey & Co., 59 percent of current U.S. manufacturing tasks could be automated in the next several years.

As with any sea change, each of us has a choice of how to respond. Will it be to ignore it, and hope it goes away? Will it be to hope that it happens after you leave the workforce, and have it be someone else's problem? Will it be to take action to adapt yourself, your company, your training and your mindset?

From the wonderful NTMA members I've met thus far, I know it's the last answer for the vast majority. But it's such a large, complex issue – what specific actions will help?

I would like to propose the following steps: determine the automation activities that will most benefit your company in the short- and long-term, identify new skill sets that will be required based on those activities, develop and implement training programs for incumbent and new employees that cover those skills, assess company culture and address gaps through well-planned change management.

All of these steps involve people – even though the topic of this issue of The Record is robotics. That's no accident, and certainly not an anomaly. Human capital, when measured globally, has 2.33X the value of physical capital, according to Korn Ferry. Direct investment in human capital has over a 10X impact on the GDP, as well.

From experiences at other manufacturing companies, I've seen first-hand the importance of picking the right place for the first taste of automation. I also can't overstate the importance of change management, and frequent, transparent communication when introducing automation. At a large precision machining company that I worked for, there were several work stations that handled the monotonous tasks of placing a specific number of tiny components into individual plastic bags, sealing the bags, and putting the correct number of bags into a bigger bag then ensuring the labeling was accurate. The weight of the components was so light that using a weight-based bagging system was ruled out. People were getting burned out in this work area – tedious, repetitive, fast-paced work with too much opportunity for error. A small group of engineers had seen some new, low-cost robots at a recent event, and decided to brainstorm a way to automate part of these work cells. All the while, the workers in the area were encouraged to give input on the process, things to watch out for, and ways that their time and energy could be deployed to more valuable activities in the company.

A small robot with a display that mimicked a human face with eyes and a mouth was brought it, plugged into a normal 110V outlet, and trained to handle the picking and placing of a set number of components in the individual bags. The workers that had been responsible for those tasks were pleased with the accuracy and consistency, and enjoyed the new opportunities to contribute in other ways. Because the company communicated up-front, often, and consistently that the automation effort was not about replacing workers, but about using their knowledge and skills in more valuable ways, this initiative had (and still has) great results. Employees in other areas were able to see and hear the positive impact of the project, and it has helped drive a culture of sharing ideas for improvement without fear of being replaced by a robot.

Treat automation as a golden opportunity to improve your company's performance, It can help improve quality, accuracy and speed, while allowing your employees to contribute in different, and likely more impactful, ways. Be open and up-front about automation 'pilots' that you have planned – and bring in as many employees as possible, as early as possible to the process. You might be surprised with what your employees have to offer, either based on their experiences and knowledge from their lives outside work, or their totally fresh perspectives. Involving people in the decision process for a change, no matter what kind of change, is one of the most effective ways to get their buy-in for the change.

If you have stories you'd like to share about automation activities at your company that might help our other members, please reach out to me at sschroeder@ntma.org.

WHAT IS YOUR ELEVATOR SPEECH?

By Bill Padnos, NTMA, director of Youth Engagement

When I first started as the executive director of the Southwestern PA BotsIQ program, I knew that I needed to come up with an elevator speech. One sentence that described the program and intrigued the listener. I came up with "BotsIQ is a manufacturing workforce development program disguised as a high school robotics competition." I figured that I was hitting all of the right notes – manufacturing workforce, students and robotics. Who would not want to stop and listen for more?

Over the years, that elevator speech evolved into "BotsIQ is a job-driven, project-based STEM learning experience that engages students in the manufacturing process of designing, building, testing and rebuilding 15lb Bots to battle in a gladiator-style competition." I know that that elevator speech is now longer, but it added more of the "buzz-worthy" key words. Greg Chambers from Oberg Industries and the Chairman of NIMS gave me sage advice to add the phrase job-driven. That helped distinguish us from the other project-based STEM learning experiences for students because we want to spark their interest in exploring manufacturing careers.

The theme for this month's issue of The Record is about robotics, and I am writing an article that actually downplays it. Too many times, the NRL is put in the same field as the other programs. But, we are not the same as FIRST Robotics, Best Robotics, Bot Ball or VEX Robotics. The NRL is in a league of its own because we stress the "job-driven" and "manufacturing process" part of our elevator speech.

I had the amazing opportunity to attended one day of the taping of this season's BattleBot TV show (starting May 10 on the Discovery Channel). I am not able to say who won or lost any of the 12 battles that I witnessed, but I can talk about the conversation that I had with one of the builders.

This builder works at a medical device manufacturing company in Florida and supports a local FIRST Robotics team. He told me how much he enjoys mentoring the FIRST team, but this work has not had an impact in him recruiting new workers or influencing the curriculum at his local schools. This provided me with the opening to give my NRL elevator speech and we talked about how the NRL program is engaging students in the complete manufacturing process. We talked about how it important it is for students to not just learn how to design a part but gain an understanding or even the skill to machine that part. We talked about automation but agreed that it is important for students to first learn mechantronics. We talked about how critical it is for students and their parents to both tour manufacturing facilities and learn about the benefits of working in industry.

I was on a roll. I gave all of the sage advice that I have been learning for the past five years. I mentioned about setting up a meeting with local educators and school administrators about the types of skills that he is looking for in his employees and provide curriculum advice. I suggested that throughout the year, he should spend time determining which of the students he would like to eventually work for him. Once he has recognized the students that are a fit for his company culture, he makes sure to provide them with a job application or an offer for a summer internship before their time together ends..

In the end, I hope that I was able to convince him that the NRL program would be a better investment in his company's time, talent and treasure and will be a champion for the South Florida area. I know that I will need to follow up with him since his bot was one of the ones that battled during the evening session. It was an exciting battle that had everyone in the audience up and cheering. If you are a BattleBot geek like me, you will want to see his bot in action.

Did you sponsor an NRL team this year? Have you offered any of the students an opportunity to work for you this summer? Have you invited the parents to tour your facility and learn from you why you work in manufacturing? Have you given recommendations to your local school about curriculum that help to prepare students for careers in manufacturing? Have you handed out job applications to the students that you want to come work for you tomorrow or in years to come?

If you are not an NRL Industry Advisor, please do not be intimidated about the word "robotics." It is just a name of the program and nothing about the spirit of the what it is all about. It is all about sparking students' interest in careers in manufacturing and learning about the amazing opportunities available to them if they pursue that pathway. It is about engaging students in the manufacturing process and learning which ones already have the necessary skills or have the potential to acquire them. That is the heart of this program and why our version of **FULL CONTACT INNOVATION** is truly the way for you to **ENGAGE YOUR COMPANY'S NEXT GENERATION**.

CONNECTICUT CHAPTER CONNECTS WITH EDUCATORS

Submitted by Dee Babkirk, executive director, Connecticut Chapter NTMA

NTMA CONNECTICUT CHAPTER

Asnuntuck Community College hosted Connecticut Chapter NTMA's board meeting on April 10 followed by a presentation from Dr. Lombella, president of the college. Participants had the opportunity to tour the college's manufacturing program area and visited their new Advanced Manufacturing Technology Center. Members were impressed with the center and what is offered to the students and saw opportunities to connect and possibly partner with the college.

Additionally, the chapter recently set up a booth at Goodwin College, a local college offering several degrees, certificate programs and individual courses in technology, supply chain, quality and manufacturing. The event was called "Making Professional Connections." A variety of associations from Connecticut were invited to speak about their association to the students that attended and were told how they can get involved. Representatives met many interested students, gathered emails and even received a resume.

The Connecticut Chapter is pleased to be connecting with educators, and ultimately students, in the region as they expand workforce development efforts.

NTMA

ROCKY MOUNTAIN BATTLEBOTS COMPETITION A SUCCESS

By Bret Holmes, Program Manager, RMBL

NTMA NORTHERN UTAH CHAPTER

The Northern Utah National Tooling and Machining Association along with Weber County School District and Ogden Weber Technical College hosted the 2018 Rocky Mountain Battlebot Competition, held Wednesday, March 28, at the Ogden-Weber Technical College. Teams consisted of students from Logan to St. George taking part in the event, making 13 teams with 52 total competitors. Thirteen industry partners supporting the event.

The competition had two major categories: battle and documentation. The combination of the two scores were used to determine the Grand Champion.

For the first time, Rocky Mountain Battlebots had a back to back champion in Samurai III from Dixie Tech College (pictured in main photo). Special thanks to this year's announcer - Rick Bouillon - who made this a memorable event.

DOCUMENTATION

1st place: Prison Shank
Davis Technical College
2nd place: Samurai III
Dixie Technical College
3rd place: Ninja
Dixie Technical College

BATTLE

1st place: Samurai III
Dixie Technical College
2nd Place: Purple
Green Canyon High school
3rd place: Stingray
Bonneville High school

GRAND CHAMPION (overall)

1st place: Samurai III
Dixie Technical College
2nd Place: Prison Shank
Davis Technical College
3rd Place: Purple
Green Canyon High school




BRAGGING RIGHTS ON THE LINE DURING ANNUAL ROBOBOTS COMPETITION

By Keith Gushard, Meadville Tribune, reprinted with permission

NTMA NORTHWESTERN PENNSYLVANIA CHAPTER

A total of 42 teams from 22 schools battled it out the first week in April for bragging rights in northwestern Pennsylvania.

Teams representing schools from Crawford, Erie, Mercer and Venango counties are in Meadville for the 12th annual RoboBOTS competition.

In RoboBOTS, high school and middle school students design and build 15-pound robots to compete in a double-elimination tournament. The Northwestern Pennsylvania chapter of the National Tooling and Machining Association started the program to spark student interest in technical careers.

Robots of all different shapes and sizes will flail away at each other throughout the day inside a plexiglass arena at Meadville Area Senior High School's gymnasium.

"We're averaging a crowd of about 1,300 each year," said Tami Adams, executive director of the local NTMA chapter. "A lot of people come to watch even if they don't have a child in the competition. It's just a fun and exciting event to witness."

The RoboBOTS competition has become much more sophisticated compared to more than a decade ago, according to Brian Deane, the local NTMA chapter's volunteer coordinator of the RoboBOTS program. Deane, president of NuTec Tooling Systems Inc., has been with RoboBOTS since it started.

"The electronics the kids are using within the robots has gotten so much better and more reliable," Deane said. "But what's more is now, the kids are using 3D design modeling."

As an example, Deane said students at Cochranton Junior-Senior High School are using three-dimensional design computer programs and a 3D printer to design and machine prototype parts to see if they fit and work together properly before machining a part for a robot.

"When the competition first started, kids were using cardboard (for prototype parts), then cutting them out of sheet metal and putting them together with pop rivets to see if the would work," Deane said.

Deane said another sign the program is working is former students who were RoboBOTS competitors and graduated want to help out as volunteers at the competition. Some are older, went to college or technical training and now work at area manufacturing companies while others are in college, he said.

Volunteers from schools and all kinds of area companies make the RoboBOTS program a success for the kids, Deane said.

"We've got more than two dozen core volunteers who come back each year

SEE "ROBOTS" NEXT PAGE

ROBOTS AT WORK: AN INTERVIEW WITH SCOTT HARMS, METALQUEST

WHO IS METALQUEST?

MetalQuest is a very unique company in that we aren't your normal job shop. Our core business is CNC production machining, however we handle many other aspects of the supply chain up to and including product line assembly. In most cases we produce higher tolerance, higher production type parts using advanced CNC multi-tasking machines.

WHEN DID YOU FIRST START TO INTEGRATE ROBOTICS INTO YOUR SHOP?

Our first robot was purchased around six years ago, and it was a Fanuc LR-Mate. We purchased this with the idea that we would learn about robots with a more basic model, then we planned on utilizing it to load and unload a CNC Lathe that was running a family of parts. This ended up to be a huge success, and we now have eight robots all doing different tasks within our company.

HOW DO YOU USE ROBOTS IN YOUR SHOP?

Our robots perform tasks ranging from packaging, to deburring, to machine tending. We have three identical LR-Mates set up to load and unload CNC lathes, which typically yield machine efficiencies in the high 90 percent range. Other applications include a top loading gantry robot that moves between a CNC Lathe, and a CNC Grinder, loading and unloading each of them as needed. This robot is equipped with several different hands, and is also tied to a pin-stamp system used to permanently identify parts including lot traceability information. Other applications we use robots for include: demagnetizing parts, deburring parts, and packaging parts. Our focus on where to apply robots usually involves repetitive motions, or any process that is a high risk for carpel tunnel, etc.

WHAT CHALLENGES DO ROBOTS CREATE?

For us, probably the biggest challenge was finding the right people that could make designing these cells their sole focus. A lot of companies use integrators to set a robot cell up, however we felt that automation is the future of manufacturing, and it was imperative we understand these technologies. Because of this, we basically created our own integration company within our company. We purchase robots directly from Fanuc, set them up from start to finish, and design/build all necessary end effectors, guarding, conveyors etc. It has been very rewarding to see this aspect of our company grow.

WHAT BENEFITS DO YOU SEE?

We have heard a few times that robots are costing peoples jobs, which couldn't be further from the truth. Robots allow us to automate jobs that people traditionally don't want to do, which allows us to do the job versus having to no quote it, or lose it to a foreign country. They allow us to be more efficient, have a higher skilled workforce and do certain tasks in a much safer manner.

HOW HAVE THE ROBOTS BEEN RECEIVED BY YOUR WORKFORCE?

Robots were received very well by our people simply because we did a thorough job of explaining that number one, nobody was ever going to lose their job because of them, and number two, we are bringing them on to do things that many of you don't want to do. Culture is a big part of our company, and by being honest with people upfront, and having good intentions, most times people will become very accepting of them. Our robots have become a source of pride for our people, not something to consider a threat.

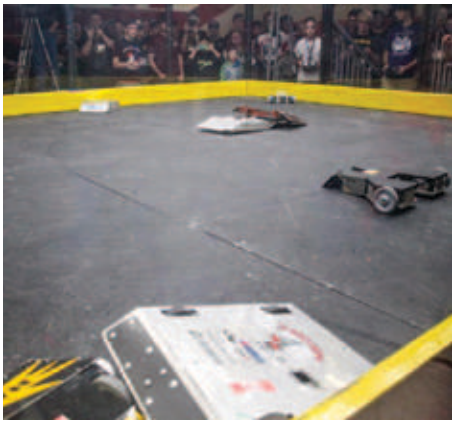
WHAT ADVICE DO YOU HAVE TO A SHOP BEGINNING TO INTEGRATE ROBOTICS INTO THEIR COMPANY?

Make sure you understand what a robot is, and especially what it isn't. Many shops would like to integrate robots in areas where it just isn't practical, and a perfect example of that are areas where you have very high mix of parts with low volumes. Oftentimes, it isn't practical to spend the time and money to design a cell to accommodate all of this, because each part is different, with different requirements. Robots shine when you have highly repetitive tasks, and the more repetitive it is, the more cost effective it usually is to use a robot. Additionally, when you start to dig into the pricing, you will see that the robot itself is oftentimes a lot cheaper than most people would think it would be. The higher costs people see come from the design time, labor, installation and troubleshooting necessary to build the cell the robot needs. These are all justified costs, and they can be drastically reduced by knowing exactly what you want out of the robot. Usually the more you ask out of a robot, the more it is going to cost you.

"ROBOTS" CONTINUED

plus others who help out," Deane said. "Everybody likes helping out the kids."

RoboBOTS also not only helps reinforce lessons in math and science but helps kids learn team building skills, he said. Learning how to communicate, budget money, delegate tasks and prioritize helps students no matter what profession they ultimately choose, according to Deane.



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Through our network of **qualified, insured and licensed** service providers, we can provide your business with **comprehensive solutions** that help you:

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> Increase Worker Productivity

> Drive Energy & Facility Efficiency

> Reduce & Conserve Operating Costs

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FOR THE ONES WHO GET IT DONE

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Specific areas are assessed across the worksite in order to identify potential hazards or high-risk areas that may require further actions be taken to remedy.

- AED Inspection
- Arc Flash/Electrical Safety
- Confined Space
- Emergency Eye Wash
- Fire Extinguisher
- Firestop: Barrier, Damper & Door
- Footwear
- Lockout/Tagout
- Machine Guarding
- Noise Survey

PROGRAM & PROCEDURE DEVELOPMENT

Effective programs and procedures help ensure compliance and create a safe workplace for your employees. These programs are developed so that your business operations can be conducted safely, and are provided through online templates or custom on-site development.

- Arc Flash/Electrical Safety
- Confined Space
- Environmental Safety Hazards
- Footwear/Benefit Management
- Lockout/Tagout
- Machine Guarding
- Medical First Aid

> ***Grainger has more safety services available to help solve your needs. Please contact your Grainger Rep for more information.***

TRAINING

We offer a wide range of EHS training courses your employees need to help them effectively perform their jobs safely. Training offerings are available through an online experience or through an on-site instructor.

- Aerial Lift
- Confined Space
- Fire Extinguisher
- First Aid/CPR/AED
- Forklift
- Lockout/Tagout
- Machine Guarding
- NFPA 70E
- Respirator

COMPLIANCE & TESTING

Audits or tests are conducted for identification and/or to monitor hazardous work areas so that controls and safe work practices can be implemented.

- Indoor Air Quality
- Noise Surveys
- Pulmonary Function Testing
- Sampling

CONSULTING & TURNKEY SOLUTIONS

We offer solutions for unique projects in EHS areas that require design and engineered solutions, installation, or may require additional areas of expertise.

- Arc Flash/Electrical Safety
- Footwear/Benefit Management
- Lockout/Tagout
- Machine Guarding
- Prescription Eyewear

Contact your Grainger Rep for details, availability and eligibility of these and other services. Services provided by a third-party provider may be subject to a fee agreement between Grainger and the provider.

ENERGY SERVICES

RETROFITS & UPGRADES

Working closely with you, our service providers can identify and facilitate the installation of energy- and water-saving measures to help benefit your bottom line with minimal disruption to your business.

- Lighting Retrofits/Upgrades
- HVAC Maintenance/ Upgrades
- Motor & Drive Upgrades
- Water Conservation Upgrades

ASSESSMENTS

Any issue within a system can reduce its efficiency, wasting steam and electricity. Services to address these issues include steam leak identification and mitigation, defective steam trap replacement and upgrades, infrared studies and insulation upgrades. Adjustments will be made to your steam system to help immediately reduce operational costs.

- Steam System/Trap Assessments/Upgrades

MIDSTREAM UTILITY REBATE INCENTIVES

Grainger can help you meet your energy reduction goals by offering discounted energy-efficient products through Midstream Utility Incentive Programs in various areas across the U.S.

- If eligible, Grainger delivers rebates on approved energy-efficient products
- Once enrolled, the process is automatic with the purchase of eligible energy-efficient products
- Rebate is credited to your Grainger account

SYSTEM STUDIES

Any issue within a system can reduce its efficiency, wasting energy. Adjustments will be made to your air supply and dust collection systems to help immediately reduce operational costs. An air or dust system audit may be required, especially if they have not been examined recently.

- Compressed Air System Studies/Upgrades
- Dust Collection System Studies/Upgrades

INSTALLATION

Electric vehicle charging stations at your facility can help advance your sustainability goals while improving your corporate image. It can also help save your customers, employees and business partners thousands of dollars. We can offer site evaluation, product recommendations and installation.

- Electric Vehicle Charging Station Installation

Contact your Grainger Rep for details, availability and eligibility of these and other services. Services provided by a third-party provider may be subject to a fee agreement between Grainger and the provider.

FACILITY SERVICES

ROOFING SERVICES

Roofing and building maintenance solutions designed to help prolong structural life, easily track and manage roof assets, save energy and improve safety.

- Patch & Repair Services
- Roofing Restoration
- Rooftop Safety Installation
- Roof Cleaning
- Inspection Services
- Preventative Maintenance Contracts
- Air Barrier Audits

ELECTRICAL SERVICES

Electrical system study is offered to determine the present degree of arc flash hazards and apply associated equipment labeling. Includes maintenance of electrical distribution system components and mitigation solutions aimed to lower arc flash energy or exposure.

- Engineering Services
- Maintenance & Testing
- Installation (Turnkey Capabilities)
- Medium Voltage/Low Voltage Services
- Emergency Services & Disaster Recovery

INDOOR COATING SERVICES

A comprehensive portfolio of installation solutions for preparing, priming, coating and protecting interior surfaces. Complete installation services for various paints and coatings.

TECHNICIAN SKILL TRAINING SERVICES

Participants receive hands-on safety and industrial skills development that they can apply on the job immediately. Training can be scheduled on-site at customer locations or off-site at scheduled locations across the U.S.

- Compliance
- Electrical
- HVAC
- Mechanical

Contact your Grainger Rep for details, availability and eligibility of these and other services. Services provided by a third-party provider may be subject to a fee agreement between Grainger and the provider.

For motorsports teams, jobs move at extremely high speeds. Part concepting, design, cutting, and testing often happen in less than a week. Our state-of-the-art CNC machine tools, along with our responsive distribution network, can provide you with a competitive advantage on the shop floor, as well as on the race track. Just ask Rocky Helms.

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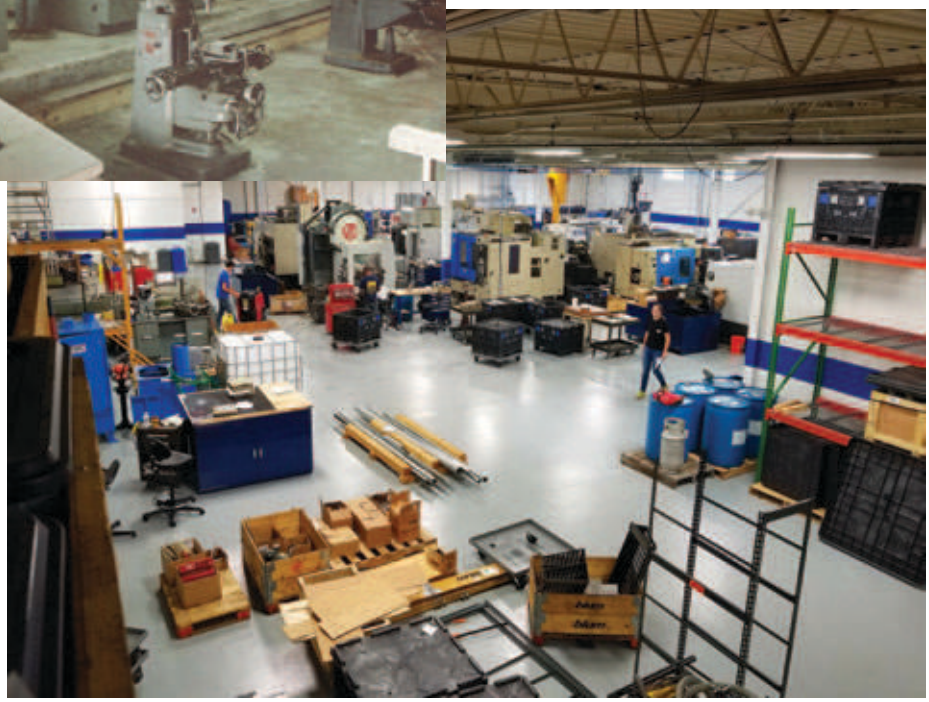
DPI INC. MAKES NTMA A FAMILY TRADITION: AN INTERVIEW WITH JEFF WOLF

By Kelly LaMarca, NTMA, Membership & Chapter Support Specialist

TELL US ABOUT YOUR COMPANY AND YOUR SPECIALTY:

DPI Inc. operates as a precision machine shop, supporting OEM businesses with primary concentration in the medical, research and aerospace industries. We've been in operation since 1988, partnering with our customers by supporting them through product development, production machining and "dock to stock" programs.

1988 (Left) vs 2018 (below)



HOW HAS YOUR BUSINESS EVOLVED OVER THE YEARS AND WHAT IS THE SECRET TO YOUR COMPANY'S LONGEVITY?

Our philosophy has not really changed through the years. Our keys to longevity and ultimately success is attributed to establishing close relationships with our customer base. We appreciate the relationships we have with our customers and we make every effort to be there for them, as business partners, achieving success together. We realized early on that manufacturing vendors can be easily replaced. With that in mind, the key component to strong customer relations and ultimately strong customer connections comes through working together, understanding your customer's culture, changing with them as cultures change and adapting to their needs quickly and efficiently. Today's business climate is different. Our corporate customers are under extreme pressures. They are lightly staffed and tasked to manage multiple functions within their own organizations. Anything we can do as a vendor to make it more effortless to deal with our company is our priority. It starts with understanding their need, followed by fair pricing, exemplary quality, and flexible deliveries.

WHY HAVE YOU MAINTAINED NTMA MEMBERSHIP FOR THE PAST 30 YEARS?

We started our relationship with the NTMA right out the gate. My father and grandfather were both in manufacturing and our family owned a tool and die, stamping and fabrication business which was also a member of the NTMA. When we branched out into the world of precision machining, we set up the company as a stand-alone business in separate locations. My father pointed me in a direction, had my back and supported me as I went out on my own. As a past NTMA chapter president, my father's advice to join the NTMA was certainly no surprise, and over the years I have used the NTMA's services in various capacities. It's just nice to know there is a network of folks experiencing the same things we all do as manufacturers. It's good to know that you can pick up the phone or drop an email and find answers to questions that arise.

TELL US ABOUT THE MULTI-GENERATIONS IN YOUR SHOP AND HOW THIS HAS HELPED IN THE SUCCESS OF DPI.

My grandfather and father were both tool and die makers. In 1947, my grandfather set out on his own, starting his own business. With the passing of my grandfather, my father took the reins of the business, expanding, adding and embracing new technology along the way to better serve his customers. I grew up in the shop environment working nights and weekends in the shop. My jobs were generally cleaning and grunt work but occasionally I was able to work on equipment; milling, grinding, or welding production jobs. After college and several years working as a design engineer for a large corporation, an opportunity presented itself to expand our family business into the world of CNC machining. It seemed only natural to come back into the fold of manufacturing as I missed the family business that was such a large part of my life growing up. It was in my blood I guess. Learning the ins and outs of manufacturing from my father, as he learned from his father, taking the best from what has worked and improving on it is what drives successful family businesses. Now, as my son follows down that same path, learning the ropes so to speak, he's able to learn from my failures and successes as he moves along his own path. Having that generational experience, an office or a phone call away, adds a level of comfort. Learning to run a family business is like learning a trade. Mentoring the next generation, teaching them good work practices and helping develop strong people skills keeps the wheels of progress moving forward.

DPI INC. PRECISION MACHINING
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POTENTIAL SHIPPING ISSUES: HOW TO BE PROACTIVE

By Leah Palnik, PartnerShip

When you deal with freight, there will always be some shipping issues that are out of your control. You can't stay with your freight throughout its whole journey, and there are a number of sticky situations you might find yourself in. However, if you know how to prepare for some worst-case scenarios, you can position yourself to bounce back quickly.

WEATHER

One of the most common disruptions that can cause shipping issues is the weather. Storms and other severe weather patterns can have a significant impact on a carrier's delivery network. When one area is hit, it creates a ripple effect that's felt all over. Especially during hurricane season and the winter months, it's important to keep an eye out. However, even in milder months, you can't let your guard down because Mother Nature can be unpredictable.

If possible, give yourself a buffer zone for transit time. Build in extra days, especially for time-sensitive shipments. That way, if a storm hits and your shipment gets delayed, you'll still be in the clear. It's also a good idea to work with a broker to gain access to additional resources in a pinch. You'll be able to expand your carrier network and lean on them when capacity is tight.

CARGO THEFT

Criminals targeting your freight are getting savvier and are constantly finding new ways to hit shippers. Dealing with cargo theft is a nightmare, and it can happen to anyone. Especially if you're shipping electronics, raw metal materials, food items, pharmaceuticals, or other highly targeted commodities. Thieves are not only surveying ship yards for arrival and departure changes, but are also engaging in sophisticated scams. Some are posing as transportation companies, using counterfeit documents, or working an inside job.

To be proactive against cargo theft and the shipping issues that go with it, there are a few simple things you can do. Ensure your driver is using a locking system that includes a variety of locks, from king pin locks, air brake valve locks, and glad hand locks. Using GPS tracking is also a good tactic to keep an eye on your freight and make sure it's where it's supposed to be. Overall, it's important to carefully select transportation providers and warehouse staff.

CYBER ATTACKS

Every time you turn on the news it seems like there's a new cybersecurity issue. Unfortunately, the shipping industry isn't immune. The technology that is on trucks nowadays can leave them vulnerable to ransomware and malware that could shut down the vehicles and put your freight at risk. Cyber attackers could potentially be targeting your freight for theft or could be looking to shut down a carrier's service in hopes of securing a ransom.

The risk of a cyber attack affecting your freight right now is slim, but cybersecurity issues are becoming increasingly prevalent across all industries. While prevention is more in the hands of your carrier for cyber attacks on trucks, staying educated and planning ahead is key. Create a plan that details what you would do in the event your freight gets caught up in the middle of a cyber attack. That way the contingency protocol is clear and you'll have resources readily available.

DAMAGES

Dealing with damaged freight involves a lot of heartache. Not only are you out your product, but you also have to deal with the nightmare that is the claims process. You may experience damages that are visible upon delivery or damages that are concealed, meaning they aren't discovered until after delivery. Luckily, as far as shipping issues go, this is one you have some element of control over.

Preventing freight damage

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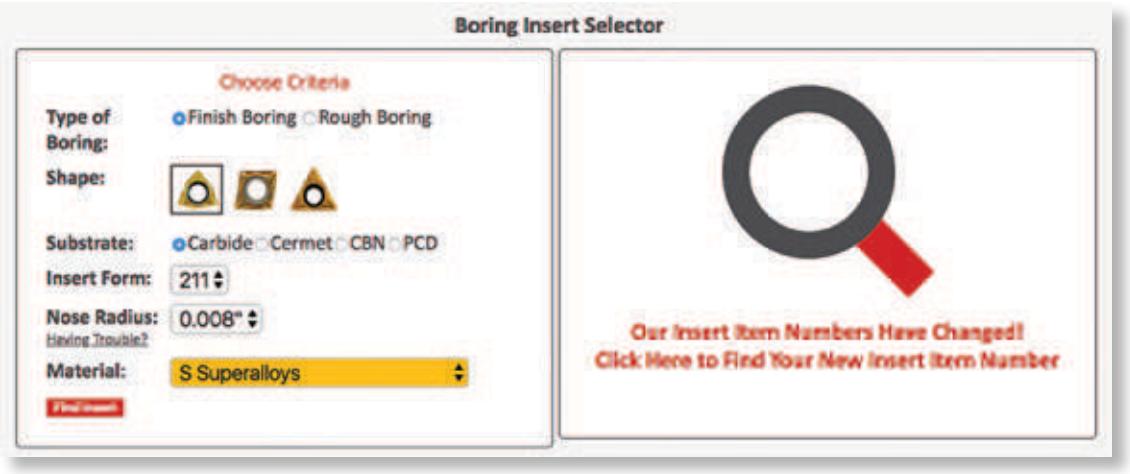
ALLIED MACHINE ANNOUNCES NEW ONLINE UTILITY: THE BORING INSERT SELECTOR

Online tool streamlines how to choose the best insert for a specific boring application

By Deborah Belew, Allied Machine & Engineering



NTMA Associate Member Allied Machine & Engineering, a leading manufacturer of holemaking and finishing tooling systems, announces their newest online tool: the Boring Insert Selector. This resource saves valuable time by simplifying the boring insert selection process and ensures machinists are provided the correct boring insert for each job's unique details. Rather than hunting through multiple catalog pages in order to narrow the field of possibilities, this online tool guides the user to the correct boring insert for the job in just six easy steps.

Allied's Boring Insert Selector allows end users to select job-specific criteria from drop-down menus. Criteria include roughing/finishing, shape, substrate, form, nose radius, and material to be machined. If users are unsure which nose radius to select for their finish boring application, this tool provides tips on formulating that as well. Once all criteria are selected, users simply click "find insert" to reveal the best choice for their unique boring application. The online tool also provides an image and link for more detailed information and pricing.

"Even the most precise boring tool in the world can be a dud if you are using the wrong insert for your application. Allied's Boring Insert Selector can maximize the performance of your modular boring investment today" said Ben Morrett, Product Manager for both Criterion and Wohlhaupter boring lines at Allied. "We are always looking for ways to help customers achieve success. This selection tool will save folks time and money by providing them with the right boring insert, the first time, for each application they face."

The Boring Insert Selector is a time saver for anyone utilizing Wohlhaupter, Criterion, or other boring tools. For more information, please visit: www.alliedmachine.com/BIS

NTMA

ALLIED MACHINE & ENGINEERING

"PARTNERSHIP" CONTINUED

starts with proper packaging. If you're the shipper, don't be afraid to spend a little extra cash upfront to ensure you're not spending more after the fact. Be conscious of the weight capacity of your chosen container and invest in quality materials. Then choose packaging that is sized right – with just enough room for the contents and the necessary impact protection. If you're palletizing your shipment, make sure your items sit squarely on the skid with no overhang. Weight should be evenly distributed with heavier boxes on the bottom, and everything should be completely secured to the skid with banding, stretch-wrap, or breakaway adhesive.

If you are receiving the shipment,

make sure you're following the proper procedures for accepting freight. Inspect your freight immediately and notate any damages on the delivery receipt. File your claim as soon as possible and make sure you have all the necessary documentation. Any small misstep can lead to your claim being denied, so it's critical that you're thorough.

Some shipping issues will be beyond your control, but that doesn't mean you're completely out of luck. By educating yourself and being prepared, you can mitigate the impact.

PartnerShip is an NTMA affinity partner—prepared to help members navigate through the toughest issues.

NTMA

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NTMA

Save the date for the 75th Anniversary NTMA Fall Conference

Join us as we celebrate our diamond anniversary and recognize the people and companies who have shaped our organization and our industry. Built on tradition and pointed towards excellence-- this is an event you won't want to miss.

We'll see you in Denver, Colorado October 23-26, 2018.