

10TH ANNUAL ROBOBOTS COMPETITION

This is what we want to see at all of the NTMA chapters; the creation of a local chapter workforce development program that engages students into learning the technical and soft skills needed for a career in manufacturing. — pp. 6-7

MEET OUR NATIONAL ASSOCIATE MEMBERS: MAKINO

Makino Director of Marketing Mark Rentschler talks about what the advanced CNC machining leader can offer to members, and their automation on the way. — p. 21

2016 STEP AWARD HONOREES

The Manufacturing Institute honored 130 nationwide women with its Women in Manufacturing STEP (Science, Technology, Engineering and Production) Ahead Award. — p. 24

APPRENTICESHIP TRAINING WITH THE NTMA-U SPRING SEMESTER

Apprenticeship is a system of worker training that has been around since skilled trades began, and although it has transitioned with advanced technology, it has stood the test of time. — pp. 30-31



EMERGING LEADERS CONFERENCE 2016

IN ANTICIPATION OF THIS YEAR'S SECOND ANNUAL EMERGING LEADERS CONFERENCE IN CHICAGO JUNE 8TH THROUGH THE 10TH, WE DISCUSSED THE TEAM, THE CONFERENCE, AND THE FUTURE OF MANUFACTURING WITH SOME OF THE EMERGING LEADERS TEAM MEMBERS. — PP16-18

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WELCOMES NEW MEMBERS

BRACALENTE MANUFACTURING CO.
Philadelphia Delaware Valley
Chapter
Mr. Ken Kratz
P.O. Box 570
Trumbauersville, PA, 18970

BUHLERPRINCE, INC.
General
Mr. Mark Los
670 Windcrest Drive
Holland, MI, 49423

BUITER TOOL & DIE, INC.
General
Mr. John Buiter
8187 Division Ave S
Grand Rapids, MI, 49548

EASTWOOD MACHINE
San Diego Chapter
Ms. Sara Odneal
9346 Abraham Way
Santee, CA, 92071

INFOFAST MANUFACTURING INC.
Philadelphia Delaware Valley
Chapter
Mr. Rich Oldham
2880 Bergey Rd Ste R
Hatfield, PA, 19440

NORTHERN MACHINE TOOL COMPANY
General
Mr. Stephen Olsen
761 Alberta Avenue
Muskegon, MI, 49441

TRUE MANUFACTURING CO., INC.
St. Louis Chapter
Mr. Rick Nahmenssen
2001 E Terra Lane
O'Fallon, MO, 63366

PDC MACHINE INC.
Philadelphia Delaware Valley
Chapter
Mr. Mateen Afazal
1875 Stout Dr.
Warminster, OA, 18974

POLYGON COMPANY
Michiana Chapter
Mr. Gerry McCoige
P.O. Box 176
Walkerton, IN, 46574

PRATTVILLE MACHINE & TOOL CO
Boston Chapter
Mr. Vincent Spinali
240 Jubilee Dr
Peabody, MA, 01960

S&K MACHINE
Northern Utah Chapter,
NTMA
Mr. Alber Shahinian
8143 South 1300 West
West Jordan, UT, 84088

SOUTHWEST IMPREGLO, INC.
Houston Chapter
Mr. Ron Shaver
15014 Lee Rd
Humble, TX, 77396

STM MANUFACTURING
General
Mr. Roger Blauwkamp
494 E. 64th Street
Holland, MI, 49423

IN MEMORIAM

MARTIN ARSENAULT

Martin "Marty" H. Arsenault, 62, of Boston, MA, passed away March 27. Marty had an entrepreneurial spirit and founded the Howard Tool Company in 1985. He became a member of the NTMA and the Boston Chapter in 2000. He joined the Boston Tooling

and Machining Association Board in 2004 and served as BTMA President for almost 3 years, ending his term in 2015. Marty was recently selected for induction into the Manufacturing Association of Maine Hall of Fame.





PRESIDENT'S UPDATE

DAVE TILSTONE / NTMA PRESIDENT

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The Technology Tours that we have been conducting since 2011 continue to get better and better, with members calling our recent Japanese Technology Tour, held April 18th to 24th, a resounding success by any measure. The week was truly packed with tons of technology, including new innovative ways to improve your business performance coupled with new ideas on how to differentiate your company from competition. If there was one theme that gleamed from the trip it would be the absolute obsession with quality by the Japanese companies we visited, including Mazak, Sumitomo Carbide and BIG Daishowa/BIG KAISER. We also learned how Memex and their Merlin software can provide real time data to you and your managers so machine and manufacturing performance can be improved. Similarly, Blaser Swisslube presented how coolant can have a dramatic impact on your productivity and profitability; the science behind their formulations specific to customer applications was reviewed using their economic model and case studies. Throughout the tours, executives of these companies joined us for meals and offered their help with applying their technologies and products.

Before I get into the details of the trip, I wanted to thank again our National Associates and sponsors of the tour, including Mazak, BIG KAISER, Blaser Swisslube and Memex. If you aren't familiar with the Tech Tour format it's quite simple; show up! We had 18 members in attendance who paid for their airfare and nothing more. That's right – all ground transportation, accommodations in 4 and 5 star hotels, meals, etc. were covered by our partners. Granted, the investment for you is the airfare, but more importantly your time. I realize these investments aren't trivial, but this is one of the best opportunities to work on your company rather than in your company. The most common comment I heard throughout the trip was "how am I going to

explain all that I've seen and experienced on this trip?"

Our trip began with visits to three of Mazak's factories in Nagoya. The automation employed and attention to process flow was truly amazing. The plants ran with a skeleton crew during the day shift and ran lights-out for the second and third shifts. Robots of all sizes loaded and unload parts. Needless to say, the facilities were spotless. Seeing all the automation, one might think that these were "standard" machines. Not the case. These tailor made machines had kitted materials delivered to the machines on pallets as well as to the assembly stations on a just in time basis. This was our first exposure to the obsession to quality and detail that we later learned is the common philosophy of the companies we visited. The workers were always attentive to their job yet greeted us with a smile and bow – they were genuinely proud of their work. Perhaps one of the most unique factories was their facility that makes their laser machines, buried into a hillside to keep contaminants at a minimum to help minimize any issues with the cleanliness specs required of lasers. As you would expect, the latest Mazak technology was on display and used to manufacture all of their machines. Seeing all of their technologies in action was a true testament to the capabilities they could provide NTMA members.

We also enjoyed a presentation by Memex President and CEO, David McPhail. David outlined the Merlin software used at Mazak and implemented at Homeyer Precision to gather and present shop floor data using MT Connect. The data gathered from the machines is used to improve the utilization of the shop floor equipment. The software presents a dashboard to the user real time manufacturing analytics. We learned that most shops have a machine utilization rate of 35-50%, and productivity improvements range from 10-50% resulting in higher profits and a 4-6

month return on their investment on the software. Case studies were also presented including the improvement Mazak realized in their Florence, Kentucky plant.

Our tour also included a visit to one of Mazak's customers, an 18-person shop that machines and fabricates large parts. The scale of the operation was much greater than one would expect from the size of the company. They were the Japanese version of an NTMA member; a private owner who invested his time and capital to become a main supplier to the machine tool industry.

In route to Kyoto we stopped and visited the Toyota Museum. It was not only a history of the Toyota company that began making looms for the textile industry and is now the largest car company in the world but included the advancements made in manufacturing technologies. On display were actual demonstrations of stamping, forging and machining using original equipment from various periods throughout the 20th century.

We then visited Sumitomo Carbide, a customer of BIG Daishowa/BIG KAISER who was proud to show us their production of standard and special tooling. Although they made toolholders at the plants we visited, the most impressive was the R&D invested in PCD and CBN tooling and the fabrication of same. Again, automation was prevalent throughout the manufacturing process. Their automation was developed in-house using sophisticated vision systems to fabricate diamond and CBN tipped inserts. Sumitomo is the largest supplier of metal cutting products in Japan and is expanding their facilities and investments in the US.

Our last stop was BIG Daishowa on the island of Awaji just outside of Osaka. We visited three of their factories as well as their technical center to see first-hand machine demonstrations. The factories were immaculately clean, highly automated

CONTINUED ON NEXT PAGE

THE RECORD

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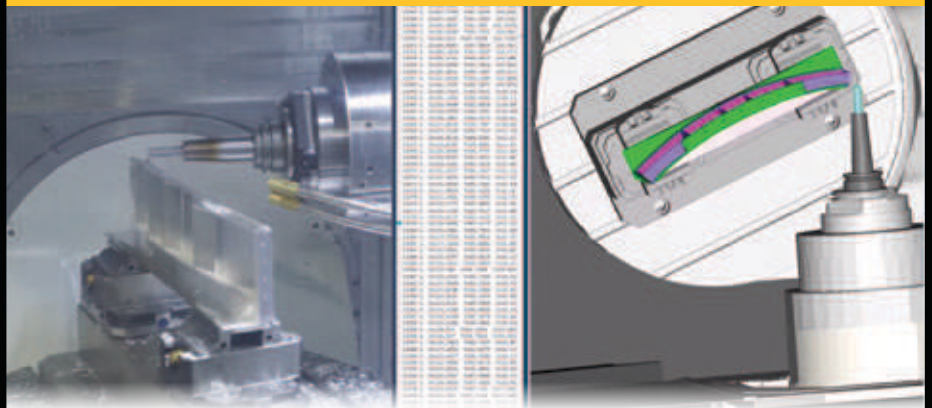
with robots and material handling systems. Cellular manufacturing was employed in most of their lines with much of the CNC equipment being the latest models of machines. Their commitment to quality was evident in every aspect of their manufacturing process. From cosmetic appearance of the tooling to the inspection processes used to verify accuracy of their products, they are obsessed with making the highest quality of tooling above and beyond industry standards. Demonstrations in their technology center included a comparison of collect chucks for endmilling, their new Smart Damper system for boring and milling to reduce chatter, a BIG PLUS comparison to HSK and their Sphinx deep hole coolant drill. All demos were very impres-

sive and outperformed their competition by wide margins.

During our visit to BIG Daishowa, Blaser Swisslube President and CEO Marc Blaser presented the importance and impact coolant can have on productivity and cost. Although coolant is only 0.5% of the cost to produce parts, it can have a dramatic affect on tool life and productivity. Marc refers to their coolant as the “liquid tool” and provided case studies to illustrate the points being made in his presentation. Productivity gains are realized by increasing machining parameters to reduce cycle time, the number of set ups and improving machine utilization. Lower maintenance and disposal costs also contribute to overall

SEE “PRESIDENT’S UPDATE” ON PAGE 7

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10TH ANNUAL ROBOBOTS COMPETITION

BY BILL PADNOS, NTMA DIRECTOR OF YOUTH ENGAGEMENT

I am in awe.

On Saturday, April 2, I drove up from Pittsburgh to Meadville Area Senior High School with my son, Ari, for the 10th Annual RoboBOTS competition. When we walked into the high school gym, the place was packed. Most of all, there was an amazing feeling of an entire community gathered to support the students. Whenever the Bots attacked, the audience reacted. Even when a Bot didn't work the way that it should have, the fans cheered them on.

Think about this: In a small community like Meadville, over 350 custom Bots (no kits) have been built since the program started in 2007 by over 2,000 students that have participated in the program. This year, 18 schools with a total of 38 teams competed at RoboBOTS. Outside of the gym, there was a STEAM showcase that included students and organizations from the area. In the showcase, you were able to drive an old Bot, interact with robotic creations and science experiments, and learn about local manufacturers and training programs. My son just wanted to visit every exhibit table in the showcase and have fun with the hands-on projects.

All around the gym, we saw volunteers wearing red polo shirts recognizing their involvement in the program for all ten years. In addition, the following organizations have been supporting the program for the past 10 Years: Acutec Precision Machining, Ainsworth Pet Products, Armstrong, C&J Industries, Channellock Inc., Highpoint Tool, Meadville Tribune, McGill Power Bell



& Associates LLC, Morlin Inc., NWPAN T M A Worker's Comp Plan, NuTec Tooling Systems, Peters' Heat Treating, Sarn Tool & Manufacturing, and Tech Molded Plastics. Even the same organization, MASH Softball Boosters, has been running the concession stand for the past ten years; with over 1,500 attendees at the day-long competition every year, this is their largest fundraiser!

When you think about an NTMA grassroots chapter program to solve the manufacturing skills and interest gap, this is it. This is what we want to see at all of the NTMA chapters; the creation of a local chapter workforce development program that engages students into learning the technical and soft skills needed for a career in manufacturing. Most of all, as these students are learning these important job-driven STEM skills, they also gain a better understanding of the benefits of a career in manufacturing.

If you do not believe me, check out all of the articles about RoboBOTS and its impact on northwestern Pennsylvania, available at www.gonrl.org/news/press-room:

• **Robo-RULERS 2016** Event Article, The Meadville Tribune, April 3, 2016

• **DECADE** The Meadville Tribune, April 2, 2016

• **Current Penn State Student Credits RoboBOTS Program** (featuring Bryce Mullen, son of Tim & Pam Mullen, Sarn Family of Companies) The Meadville Tribune, March 31, 2016

• **From Brain to Bot Where are inaugural RoboBOTS participants now?** (featuring Maplewood High School graduates) The Meadville Tribune, March 30, 2016

• **RoboBOTS One Way Trade Group Attracts Future Workers** (featuring Mecal by Sarn, Rob Smith, Acutec Precision Machining, and online photo of Highpoint Tool) The Meadville Tribune, March 29, 2016



• **10 Years of RoboBOTS: Founder Figured Mix of Technical Education and Sport Would be Big Hit** (featuring Scott Hanaway, Tech Molded Plastics and Brian Deane, NuTec Tooling Systems) The Meadville Tribune, March 28, 2016

• **10 Years of RoboBOTS: Sophistication of Bots and Builders Skyrockets** The Meadville Tribune, March 27, 2016

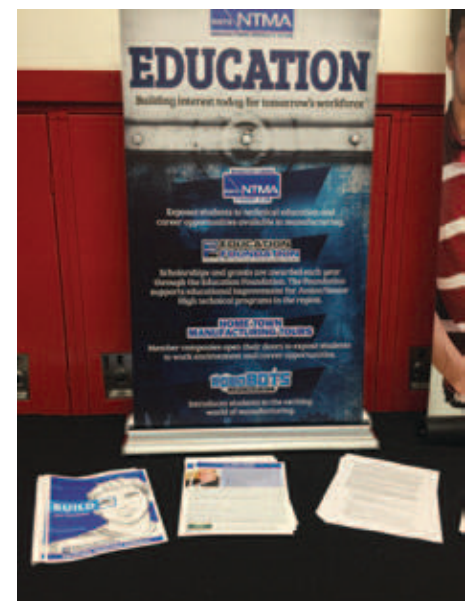
• **Today's RoboBOTS Battle Ring has Ties to Early Internet Search Pioneer** The Meadville Tribune, March 27, 2016

• **Editorial: 10 Years in, RoboBOTS is a model of fun with a serious purpose** The Meadville Tribune, March 17, 2016

And, yes, there was a competition taking place. Congratulations to all of the winners:

1st Place: Juggernaut, Cochran High School

2nd Place: Nemesis, Union City High School



SNK AMERICA ANNOUNCES NEW NIIGATA AND SNK NISSIN DISTRIBUTION IN TEXAS



SNK America is proud to announce its partnership with Associated Machine Tool Technologies (AmTTech) to distribute NIIGATA horizontal machining centers, SNK Nissin horizontal boring mills and SNK double column machining centers in Texas. AmTTech has been serving the Texas market for 25 years and has built a reputation for both selling and servicing high quality CNC machine tools.

"Our #1 goal is to provide our customers with the best possible value-based solutions for their machine tool requirements. But even more importantly, we strive to provide our customers with a level of service that exceeds their expectations," says Anne Beauregard, AmTTech V.P., Chief Financial Officer. "We are extremely excited to be representing SNK America because they share our same mission of providing quality products and outstanding customer service."

Tom Klukow, Regional Sales Manager for SNK America, is also excited to be working with AmTTech. "AmTTech is one of the premier distributors in the state of Texas. While they provide machine tools to all markets, they are particularly strong in the energy and aerospace sectors, a perfect fit for SNK/NIIGATA.

NIIGATA horizontal machining centers are available in a variety of sizes and have design features that we believe can have a major impact on the Texas manufacturing market. Offering not only the heavy duty box guides that the HN Series has become famous for, they also feature programmable U axis facing options and programmable W axis quills that make them invaluable for the energy industries.

The NIIGATA SPN Series was the first to feature the Box-in-Box design with linear roller guides. The speed and performance

greatly enhances productivity wherever cycle times and accuracy are required.

The hybrid design of the HN-S Series with its combination of box guides in the Y axis and heavy duty roller guides in the X and Z axes offer a combination of durability and speed.

These three models-all with best-in-class work envelopes and pallet sizes ranging from 500mm to 1,600mm-make it possible for SNK/NIIGATA to offer the best solution for virtually any application."

AmTTech is headquartered in Houston and has an office in Arlington. They provide service, training and have a team of qualified application engineers to provide time studies, machine recommendations and training programs. For more information, visit www.snkamerica.com.



3rd Place & King of the Ring: Calequaque, Cochranon High School
Best Documentation & Best Sportsmanship: Lenny P's Swaggin Wagon, Cochranon High School

Cooler Bot & Best Engineered: The Magic 8 Ball, Crawford County Tech

I know that this might be a cliché, but everyone won on Saturday, April 2nd at RoboBOTS. The students learned the skills needed for a career in manufacturing and gained a better understanding of the benefits of exploring this career pathway, and the NTMA member companies established relationships with their local schools and are creating workforce pipelines. In the end, the

region wins because the manufacturing companies will stay and flourish with the influx of the next generation of workers.

The sponsors for the competition are too numerous to mention in this article. They range from CPA firms, to insurance agencies, to local media to manufacturing suppliers and NTMA member companies. And this does not even include all of the companies that support the individual teams. In addition, the NWSA NTMA Education Foundation promoted \$10,000 in scholarships for students interested in exploring manufacturing career pathways, ranging from \$500 to \$3500 per scholarship.

All of this is happening in northwestern

Pennsylvania because an NTMA chapter decided 10 years ago that it must do something about the future of manufacturing. Now it is your turn to act. I look forward to being at your chapter's NRL competition and being in awe of what I see.



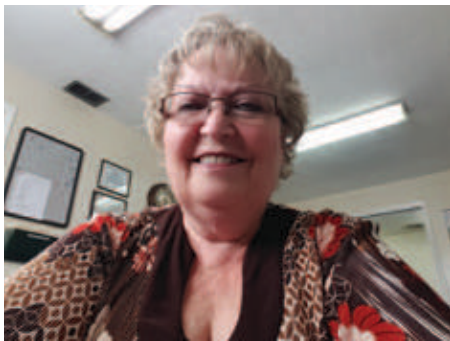
PRESIDENT'S UPDATE CONTINUE

lower costs of production. These improvements are quantified to the end user using an economic model developed by Blaser. Having seen first-hand the commitment Blaser has to the science behind coolant on last year's Swiss Tour, it was no surprise to see that BIG Daishowa uses Blaser's coolant in their machining operations. Success stories at Homeyer Precision and Vaughn Manufacturing were noted and a direct result of Herb Homeyer and Mark Vaughn attending the Swiss Tour last April.

Hopefully you have gathered that this was a fantastic trip to experience new technologies, and the commitment of all of our partners to help you reduce costs and be more profitable. It was also a wonderful introduction to the Japanese culture, their attention to detail and absolute commitment to quality.

DAVE TILSTONE / NTMA PRESIDENT





SHERRY MOWERY, PRECISION TOOL & MOLD, INC.

TELL US ABOUT YOUR COMPANY:

Precision Tool & Mold, Inc. has the capability to design, build and run plastic injection molded parts. I am President of the company, which my husband and I started in 1981.

WHAT BROUGHT YOU INTO THE MANUFACTURING INDUSTRY?

My husband started Precision Tool & Mold, Inc. while still working for a large electronic company as a shift leader. At the time, I was employed by a utility company. After having to go back and forth between companies during lunch and after hours, it became too much and I actually started working with my husband full time taking care of accounting and any other small jobs I could.

WHAT MOST INTERESTS YOU ABOUT THE INDUSTRY?

I've always been fascinated by the end product. I never realized that a plastic comb didn't just come from the store.

WHAT HAS YOUR EXPERIENCE IN THE INDUSTRY BEEN, AND HAS YOUR GENDER PLAYED A ROLE?

I've actually been a hands-on person. Our

expertise was originally in mold building, where I wasn't too involved, but when we decided to get into the molding end of it, I took over that portion. Many of our larger customers started going to China to have the molds built, so slowly-but-surely our biggest portion of the business started moving towards production. My gender has never contributed to a negative experience – in fact, the positive part right now is that many large companies are looking to put out work to minority businesses, which a woman-owned business we fall in that category.

HOW HAVE YOU SEEN THE INDUSTRY EVOLVE?

It's definitely growing in leaps and bounds. **HOW DO YOU HOPE TO SEE THE INDUSTRY EVOLVE IN THE NEXT DECADE?**

We continually strive to become bigger and better.

WHAT ADVICE DO YOU HAVE FOR EMERGING LEADERS AND FEMALE STUDENTS INTERESTED IN MANUFACTURING AND STEM CAREERS?

Learn all aspects of the business and don't be afraid to move forward and try new things.

WHAT TRENDS DO YOU SEE IN THE INDUSTRY?

We started with one molding machine and currently have 20 presses ranging from five ton to 200 ton, always buying new equipment and staying on top of new technology.

We are also ISO 9001:2008 now, which we just accomplished a year and a half ago.

HOW DOES YOUR COMPANY SUPPORT ANY INDUSTRY INITIATIVES?

By sending students to local programs and training.

ARE YOU INVOLVED IN GROUPS OR ASSOCIATIONS FOR WOMEN IN MANUFACTURING?

Not necessarily women, but have been a member of National Tool & Manufacturing since the 80's. My husband was President of the local chapter for four years and I was the Executive Secretary for seven years.

WHAT BROUGHT YOUR COMPANY TO THE NTMA?

The membership drive.

FINAL THOUGHTS:

Another asset, and most important in our success, is our employees. We have always strived to treat them with respect and fairness and in turn we seem to maintain employees for many years. Turn over is very low.



If you would like to be featured in our NTMA Women in Manufacturing series, contact Nikki Hunt at nhunt@ntma.org for more information.

NTMA WELCOMES ARTHREX INC.

NTMA is excited to welcome Arthrex Inc. of Naples, Florida, to the NTMA family. Arthrex is a global medical device company and leader in new product development and medical education in orthopaedics that began in 1981. With a corporate mission of helping surgeons treat their patients better, Arthrex has pioneered the field of arthroscopy and developed more than 9,500 innovative products and surgical procedures to advance minimally invasive orthopaedics worldwide. Their products include shoulder, knee, hip, and small joint surgery for both the human and veterinary markets.

Arthrex is utilizing the NTMA-U training portal to provide precision manufacturing training to their staff members. By utilizing the NTMA-U portal model, Arthrex will be able to provide high-quality, industry-specific training to an unlimited numbers of their employees this year.



BIG KAISER EXPANDS SMART DAMPER LINEUP WITH THE ADDITION OF EWN & EWD SMART DAMPER BORING HEADS

BIG KAISER

BIG KAISER introduces the EWN & EWD Smart Damper - precision boring heads with a patented damping system to eliminate vibration in deep-hole finish boring.

The integral design of these new heads shortens the distance from the damping mechanism to the cutting edge, which is the source of vibration. This produces higher damping effects to the tool assembly to minimize the chatter or vibration - thus achieving better surface finishes and improved metal removal rates.

"For precision machining of deep bores, it had previously been necessary to program low cutting parameters in order to prevent vibrations, which unnecessarily increases machining time," says Jack Burley, VP

Sales & Engineering of BIG KAISER. "The EWN/EWD Smart Damper overcomes this problem, and enables high cutting parameters to be used. This means that extremely short turnaround times can be achieved, which improves productivity by up to a factor of ten."

Our tests have shown that deep holes free of vibration can be bored with an excellent surface finish with dramatic time savings. For example, with a projection length of 14.3" working with high-carbon steel at a cutting speed of 1,300 SFM, an impressive feed rate of 11.4 IPM was achieved with the EWN41 Smart Damper.

The newest Smart Damper solution is either equipped with the tried-and-true EWN ana-

log boring head series or the latest digital technology in the EWD series. The EWN heads feature a dial with $\varnothing.0005$ " / div setting accuracy ($.0001$ " w/ Vernier). The EWD heads have a large digital screen, which clearly shows adjustments to an accuracy of $\varnothing.00005$ ", thus helping to minimize operator errors and removing the need for complicated Vernier markings. The digital display can be reset to zero at the push of button and has an auto power off function, while the current position of the cutting edge will be shown automatically again due to direct path measurement when the tool is switched on.

The new Smart Damper is compatible with BIG KAISER's modular CK/CKB

system, which means that the length of tool combinations can be freely selected up to a maximum of ten times the diameter, and are capable of being run on nearly every major spindle interface. All tools are coolant-through, and thanks to three different insert holders per head size, an extraordinary boring range is possible. For example, the EWN and EWD68 heads can bore a range of $\varnothing 2.677$ " - 5.906 ". For additional peace of mind, all BIG KAISER EWD heads have a seal rating of IP 69K - the highest possible. For more information, visit www.us.bigkaiser.com.



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- ✓  Profiling
- ✓  Facing

MAZAK TO CONSTRUCT NEW PLANT IN JAPAN

Building upon its “Rock Solid” business foundation and international leadership in the machine tool industry, Yamazaki Mazak has announced the construction of a new production facility in Inabe City, Mie Prefecture, Japan. The new Yamazaki Mazak Inabe Plant will combine production automation and Industrial Internet of Things (IIoT) technology, as key components of Mazak’s iSMART Factory concept.

The Inabe Plant follows suit with Mazak’s Kentucky plant where the iSMART Factory concepts are already well entrenched, as well as

with the existing Yamazaki Mazak Oguchi Plant in Japan that will be a full iSMART Factory by the end of 2016. As an iSMART Factory and with 56,000 m2 of planned floor space for manufacturing larger size machine tools, the new Inabe plant will boost productivity by more than 50 percent.

Mazak’s iSMART Factory is one that uses advanced manufacturing cells and systems together with full digital integration to achieve free-flow data sharing in terms of process control and operation monitoring. In the iSMART Factory, the MTConnect® open communications proto-



col works with process support software and provides connectivity and the capability to monitor then harvest data from all the different production floor machines, cells, devices and processes.

Operation from the current Yamazaki Mazak Seiko in the Mie Prefecture will transfer

to the new plant in stages. Completion and full operation of the ¥20 billion Inabe Plant is scheduled for 2019. For more information, visit www.mazakusa.com.



RESHORING PLUS FDI REMAINED STRONG IN 2015

THE NUMBER OF COMPANIES BRINGING JOBS BACK CONTINUES TO INCREASE

The Reshoring Initiative®, an organization committed to helping manufacturers recognize the profit potential of local sourcing and production, has announced that “reshoring plus FDI remained strong in 2015” and surveys consistently show that the trend is increasing.

According to the Reshoring Initiative’s calculations, about 240,000 manufacturing jobs have been brought to the US from offshore in the last six years. This job gain is the result of both new reshoring—the return of manufacturing work by U.S. companies—and Foreign Direct Investment (FDI) by foreign companies into our manufacturing sector. It also represents about 28% of the total increase in U.S. manufacturing jobs since the low of 11.45 million in

February 2010. About 12.32 million Americans are now employed in the manufacturing sector. In fact, research shows that more manufacturing work is now coming to the U.S. than leaving the country.

A STRONG RESHORING TREND IN 2015

According to the Boston Consulting Group (BCG) Annual Survey released in December 2015, “the percentage of companies actively moving operations back to the U.S. continues to increase.” Of particular interest was the number of 2015 studies documenting the strength of the trend:

- BCG: Multinational industries actively reshoring increased 140% from 7% in 2012 to 17% in 2015

- Medical Design Technology: 49% of medical device companies outsourced

offshore. Almost half of those, 45%, are returning

- Plastics News: 70% of plastics industry manufacturers have or will soon reshore

- Alix Partners: U.S. is favored over Mexico 55% to 31%

- Walmart continues to make good progress towards its \$250 billion 10-year goal

- Reshoring Initiative’s preliminary statistics for 2015 show that reshoring and FDI resulted in around 66,000 U.S. manufacturing jobs. Final results will be released in early 2016.

“I spoke to AGMA and ABMA [Gear and Bearing Manufacturing Associations] in May 2015. In a poll of attendees, 54% had reshored or said that their customer had,” says Harry Moser, founder and president of the Reshoring

Initiative and retired president of GF AgieCharmilles.

TOOLS FOR BETTER SUPPLY CHAIN SOURCING DECISIONS

The Reshoring Initiative offers many tools and resources to help companies make supply chain sourcing decisions. The Reshoring Initiative’s Total Cost of Ownership Estimator® is the best-known tool for this purpose. It uses advanced metrics that allow users to easily determine the total cost of offshoring by accounting for and understanding the relevant offshoring costs, which include inventory carrying costs, shipping expenses, intellectual property risks and more.



REAL-TIME FACTORY FLOOR DASHBOARDS

Make instant decisions with configurable dashboards that monitor production against goals. Display dashboards on TV screens across the shop floor, or access from any internet connected device.

OPERATOR VIEWS

Operators can instantly categorize downtime or reject reasons via touch screen devices displaying data from a single machine.

INSTANT NOTIFICATIONS

For any job that falls behind, instant text and email notification can be sent, giving managers who aren't on the shop floor the information they need to take immediate action.

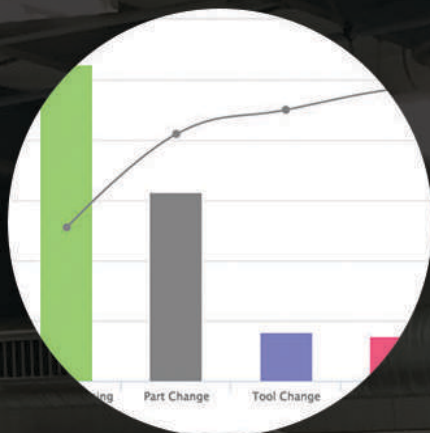
WHAT IS MACHINEMETRICS?

MachineMetrics software helps manufacturers become more lean by providing real-time production visibility and deep analytics. Data from any machine is made actionable through instant notifications and dashboards displayed on the shop floor.



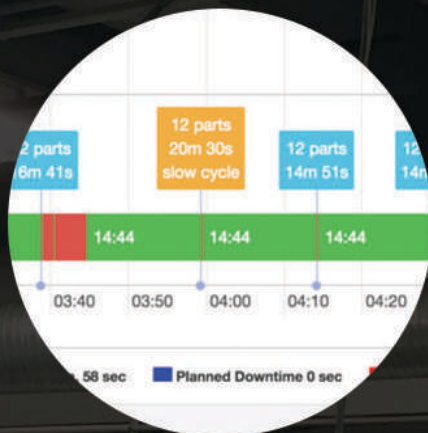
“ I’d have to hire 30 people to accomplish what MachineMetrics does. ”

STEVE CAPSHAW PRESIDENT, VALLEY STEEL STAMP



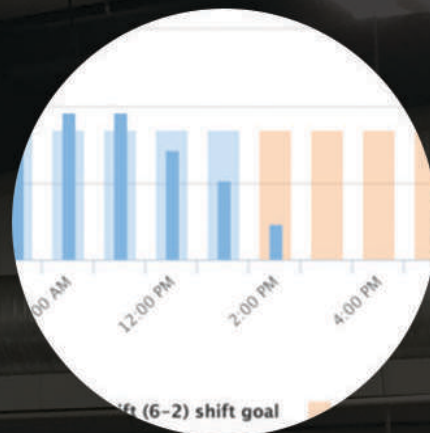
DOWNTIME & QUALITY PARETO CHARTS

Immediately identify the most significant recurring problems at your factory based on operator input and machine data.



MACHINE EVENT TIMELINE

A timeline displays every event as it happened which can be used to identify the state of a machine at any time - such as during a machine crash or shift change.



SHOP FLOOR REPORTS & OEE

Evaluate the performance of your entire shop floor. Report on part production trends, utilization, quality, overrides, and OEE for each job broken down by shift.

JOB SCHEDULING & DISPATCHING

Automatically dispatch jobs based on program name from the machine, or manually start pre-configured jobs from a touch screen.

JOB CHANGEOVER TRACKING

Setup times for the same job can vary wildly by operator or by shift. MachineMetrics analyzes setup time by incorporating it into the workflow when dispatching jobs and displaying setup reports.

AUTOMATIC DATA COLLECTION

Collect data automatically from almost any machine type with seamless support for MTConnect, Fanuc Focas, OPC, and over 100 various PLCs.

ERP INTEGRATION

We can build a custom integration for you or work with a System Integrator who can build their own integration with MachineMetrics' API's.

“

Within the first 30 days of installing MachineMetrics, a single operator improved 4 jobs in his cell. We calculated it will save us over 900 hours of annual labor as a result!

”

GARY BRUNER PRESIDENT, CAROLINA PRECISION MANUFACTURING

STAY CONNECTED.

Make your business more productive by staying connected to your part-processing operations — whenever and wherever you want. Remotely monitor your machine status with Mazak iSMARTLink, or use our revolutionary Mazak SmartBox technology platform to easily and securely manage equipment utilization, energy consumption and more.



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OKUMA ECO SUITE REDUCES POWER CONSUMPTION



Rising energy costs continue to affect profits and be a major concern for machine shops of all sizes. Hidden costs in CNC machining such as machine tool idling, unnecessary pump rotation and continuous running of peripheral equipment guzzle energy. Having the ability to manage these costs can provide significant savings.

A new white paper published by Okuma America Corporation, titled "Energy-Efficient Machine Tool Technologies, For Any Size Shop," discusses findings from a 2015 survey of metalworking companies which revealed that shops could see an energy cost increase of \$21,541 in just one year. The white paper describes how Okuma's ECO suite technology, part of OSP suite, can achieve significant energy savings by reducing power consumption during machine operating and waiting times. ECO suite is available on Okuma machines equipped with the OSP-P300 control and the new OSP suite application.

ECO suite reduces power consumption through four new intelligent control applications:

ECO IDLING STOP:

The world's first application that stops machine tool idling, ECO Idling Stop has shown energy savings up to 74 percent during non-cutting operation (over a one month time frame). Using Okuma's Thermo-Friendly Concept, this feature monitors the cooling status of the milling and turning spindles and automatically turns them off when cooling is complete.

ECO POWER MONITOR:

This allows operators to see how much energy is being used and saved. The ma-

chine tool's display shows power consumption for spindles, feed axes and peripheral equipment.

ECO HYDRAULICS:

This optional feature provides accurate machining control at a very low rotation speed minimizing unnecessary pump rotation during dwell pressure applications. Rotation is optimized by combining the servo control technology on the machine tool with high efficiency hydraulic pumps. Demonstrations have shown 63 percent reduction in power consumption.

ECO OPERATION:

Operators set time limits for peripheral equipment, automatically stopping them after cutting is finished.

In addition to efficient technologies, many Okuma machine tools are equipped with a PREX Motor. PREX motors are compact and lightweight and are the first commercialized high-performance reluctance motor to make acceleration and deceleration highly responsive. Their ideal combination of horsepower, torque, thrust, and lower inertial mass is designed to optimize machine performance and reduce energy consumption by 5-13%.

Okuma's ECO suite won the Excellence Award/Minister of Economy, Trade and Industry Award at the 45th

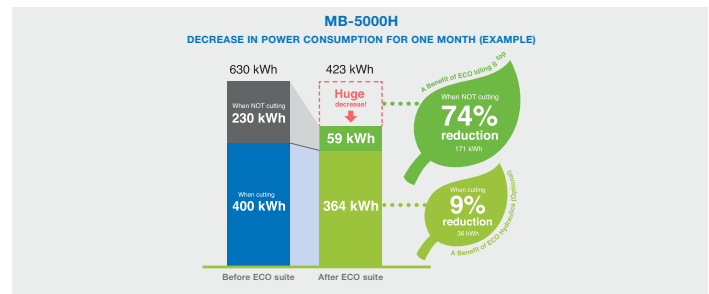



Figure 2: Example of the decreased power consumption that ECO Idling Stop can achieve in just one month. (Calculated from actual power consumption measurements. Power consumption will differ depending on machine specifications and usage conditions.)

Machine Design Awards, sponsored by the Nikkan Kogyo Business and Technology Daily News.

For more information on Okuma's energy saving ECO suite, visit www.okuma.com.



Figure 3: The ECO Power Monitor's operation screen, shown here on a 19-inch display.



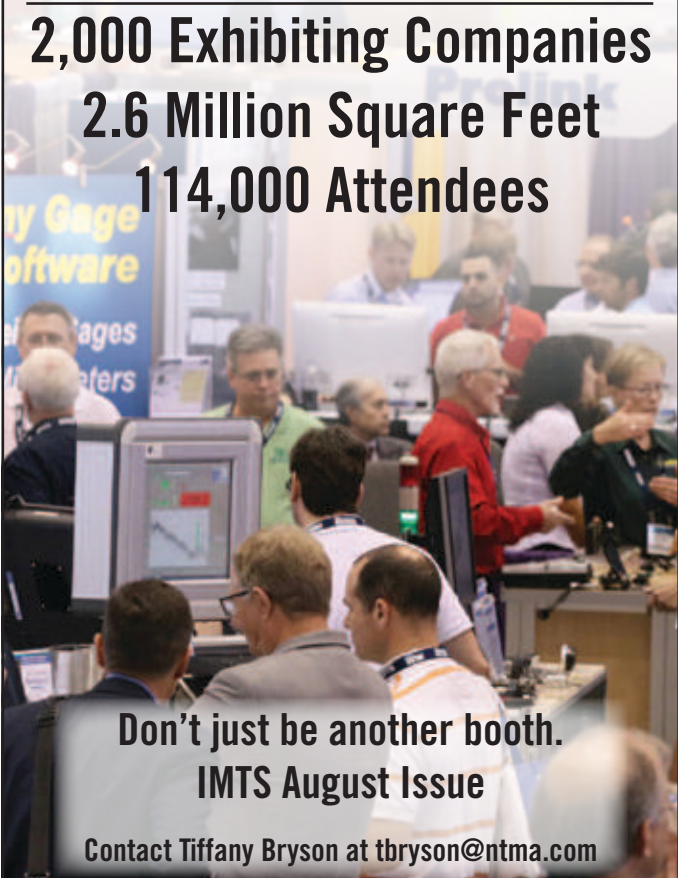
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EMERGING LEADERS CONFERENCE 2016: WHAT YOU SHOULD KNOW

The NTMA Emerging Leaders Conference offers up-and-coming professionals from around the country the opportunity to gather in an intimate setting to learn, share insights and discuss the issues that matter most to them and their leadership position. In anticipation of this year's second annual Emerging Leaders Conference in Chicago June 8th through the 10th, we discussed the team, the conference, and the future of manufacturing with some of the Emerging Leaders team members.

INTRODUCTIONS:



Kelly Kasner (KK), Emerging Leaders Team Staff Liaison & NTMA Midwest Region Membership and Chapter Services Executive



Gretchen Homeyer (GH), Homeyer Precision Director of Employee Relations & Emerging Leaders Co-Team Leader



Zac Overton (ZO), Overton Industries Sales & Applications Engineer & Emerging Leaders Co-Team Leader

HOW LONG HAVE YOU BEEN WITH THE EMERGING LEADERS TEAM?

KK: "Since 2012"

GH: "Two years."

ZO: "I have been a part of the team in some fashion since my first meeting in 2009. I have been a formal team member since about 2012."

WHAT IS AN EMERGING LEADER?

ZO: "An emerging leader is a person who believes that they have room for growth within their company or industry. Whether it is a shop floor manager with aspirations to be VP of Operations or Sales Manager who wants to be CEO, we are all striving to be better."

KK: "They're someone who positively influences others."

WHAT IS THE EMERGING LEADERS TEAM?

KK: "The mission of the Emerging Leaders Team is to assist NTMA member companies and affiliates in the development and support of new and future leaders to ensure the company's successful operation and succession. The team currently consists of Co-Team Leaders, several team members, an Executive Committee Liaison and an NTMA Staff Liaison."

ZO: "The team is a group of individuals that believe educating the next group of management is crucial to our ongoing success. The industry focuses a lot on "workforce development," but that is almost always seen as operators, tool makers, "doers." What we are doing is bridging that gap between hiring good employees and developing a solid core of management personnel. Without competent management making sound decisions, it won't matter if you have the best people."

HOW WAS THE TEAM CREATED?

KK: "Through the team's revitalization last year, we identified although younger individuals are the most popular emerging leaders, there is a strong gap between them and the average age of a new small-business owner which hosts its own area of opportunities. There is also an increasing need to identify and customize training, education, technical assistance and networking opportunities oriented toward the needs of non-traditional owners and professionals such as women, individuals over the age of 50 and employees emerging in leadership in other capacities, i.e. Sales & Marketing, Production, Finance, Human Resources, Quality, etc."

ZO: "The group was rebranded about 2 years ago because the name "Next Generation" was too familial sounding. There are many members of NTMA that are in management and would like to participate with our group as we are all striving for success, but thought you had to be a family member or future owner. That isn't the purpose of Emerging Leaders. My sole focus since joining the group was to make sure that if you were wanting to do better, be better, lead better, that we could give you those tools."

WHAT ARE THE GOALS OF THE EMERGING LEADERS TEAM?

KK: Our goals include, but are not limited to, providing networking opportunities for new and future business leaders, increasing involvement of new and future leaders in the NTMA and affiliates, and providing a rotational education and training program to help businesses plan and train for leadership transition."

ZO: "In simple terms, our goal is to bring content to the Emerging Leaders that attend our events and get involved in our programming. We want our members and attendees to walk away from our content with actionable information that can make

themselves and their company operate at a higher level.

WHAT IS THE EMERGING LEADERS CONFERENCE?

KK: “The Emerging Leaders Conference brings together older workers’ experience, training professionals, and Emerging Leaders’ creativity leading to groundbreaking innovations. The conference creates an open mentoring culture where people learn from each other in a wide variety of formal and informal relationships; use social media technology to help people sign up and get connected; and bring people together for coaching, training, roundtables and networking (even cross-industry networking) that are all essential for growing and sustaining leaders.

WHAT SHOULD FIRST TIME ATTENDEES KNOW ABOUT THIS CONFERENCE?

GH: “One of the things that sets the Emerging Leaders conference apart from other conferences is that you are there with other leaders who are in the same position as you, and not only veterans of the industry. It’s important to network with people who are facing the same issues to be able to collaborate and work together to solve problems that many of us face. We have a focus on leadership development and other key areas of the business that many of us do not have years of experience dealing with. To be able to attend these meetings with people who are facing the same challenges you are increases the takeaways immensely.”

KK: “Since a participative culture is essential to creating leaders in a multigenerational environment, how do you keep that type of culture in place through change? The answer is in ‘telling the story’ among like-minded individuals. There are many on-line resources, organizations, consultants and training courses across the country providing leadership training, business tools and legal advice for businesses. There is no better resource for ‘relevant experience’ than fellow NTMA members and associate partners who can provide the best leadership learning and succession tool, an example.”

WHAT CAN ATTENDEES LOOK FORWARD TO AT THIS YEAR’S CONFERENCE?

GH: “This year attendees will have 3 days of workshops to attend as opposed to 1 day last year. We’ve expanded the content that we are able to offer to touch on even more topics that are important for today’s emerging leaders. Along with the leadership, financial, and sales aspect of the conference

you will be able to network with your peers in the beautiful city of Chicago!”

KK: “Attendees can look forward to seeing emerging technologies and witnessing successful team building and leadership models via a tour of valued NTMA National Associate, Big Kaiser. Another exclusive, our ‘Night in Chicago’ will highlight the local scene with scheduled social stops to area craft brewers and entertainment restaurants. The restaurant industry requires working through a lot of adversity to get their business up and running, and it is a highly competitive/challenging business. We will learn team building best practices from this experience as well as addressing adversity and how they developed multi-level relationships that support them as a business leader/owner.”

WHAT HAVE ATTENDEES SAID ABOUT PAST CONFERENCES?

GH: “The first Emerging Leaders conference was very successful. Many of the attendees were very pleased with the content that was offered and the networking relationships they built.”

KK: “We received many positive survey responses from last year’s Emerging Leaders Conference attendees, included “I liked being able to hear and engage with leaders that are facing some of the same issues as myself,” and “The biggest value was Networking and attending the speaker presentations.”

WHAT DOES THE FUTURE OF THE TEAM LOOK LIKE?

KK: “The Emerging Leaders team is committed to improving the identification and participation of first and next generation individuals of NTMA member companies and associates by guiding and providing necessary resources and tools to attain desired authentic leadership excellence and measurable engagement with educational and mentoring programs. Our initiatives will continue to complement the strategic plan of the NTMA. We will also highlight best practices for attracting, advancing and retaining strong manufacturing industry leadership talent.”

GH: “The Emerging Leaders team continues to grow and flourish. We are the future of the American manufacturing industry and it is imperative that we focus on developing ourselves early in order to make sure that we grow into the leaders that manufacturing needs. Due to the lack of growth in manufacturing during the 80’s and 90’s we have a gap in leadership that needs to be filled. It is up to us to step up and fill this

gap for our industry.”

IN YOUR OPINION, WHAT DOES THE FUTURE OF MANUFACTURING LOOK LIKE FOR TODAY’S EMERGING LEADERS?

GH: “The future of American Manufacturing looks bright for today’s emerging leaders. The industry is making a big push to advocate the importance of manufacturing and building a highly skilled workforce. Our industry has a strong focus on the use of new technology and it’s important to be on the forefront of this to stay competitive. Manufacturing is not a dark, dirty workplace anymore; it is an industry that utilizes some of the most leading edge technology that is available. I recently returned from the One Voice legislative conference in Washington D.C. and it is obvious that we will have to have a partnership with our legislature to grow and as industry. Emerging leaders in this industry will have a chance to be a part of this push, and that’s an opportunity that shouldn’t be passed up.”

WHAT ADVICE DO YOU HAVE FOR EMERGING LEADERS?

KK: “Sign up, get connected, stay connected, and never stop learning and developing your authentic leadership style. People change and how a leader influences positively changes as well.”

GH: “My advice for emerging leaders is to embrace their role in today’s manufacturing industry and to know that they add value. Often times it’s intimidating to sit at a table with industry veterans and feel like you have a voice, but a fresh perspective can often times be the key to success for many companies. Working with other emerging leaders will help with professional and personal development in growing your voice with your company and the industry.”

ZO: “There is nothing that you are going through that someone else in the association hasn’t gone through before. Don’t blindly blaze a new trail when someone else already built a road.”





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THIS SHOP'S TRAINING PROGRAM PAVES A PATHWAY TO EMPLOYEE SUCCESS

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LEANWERKS

These days, you're simply not going to get a steady flow (heck, not even a trickle) of experienced machinists or vocational school grads applying for a job at your shop. This has spurred many shop owners and managers to take matters into their own hands by developing some flavor of in-house training or apprenticeship program for prospects who have a nice mix of "soft skills," as well as the openness to consider a career in machining.

These efforts vary in sophistication from simple shadowing of experienced shopfloor employees to more formal, structured programs. LeanWerks, led by company president



and founder Reid Leland, decided to take the latter approach, establishing its Technical Excellence Training (TExT) program in 2010. Mr. Leland says in doing so, the company was able to take control of its own destiny in terms of filling its own pipeline with shopfloor talent.

The TExT apprenticeship program is different than other home-grown initiatives I've encountered, as is demonstrated by the following five goals the shop identified while developing it:

1. Provide a clear pathway leading to a machining career. As shown in the chart on the facing page, new hires can decide how far they'd like to advance on a career path at LeanWerks, which offers 10 levels of professional qualifications ranging from trainee to senior process engineer (understanding that the top four levels require there to be a job opening). Certification in various quality control and continuous improvement concepts is offered, too.

2. Break the common four-year journey-worker certification process into smaller segments. Employees receive certificates each time they complete a TExT course, unlike conventional programs in which the payoff of a certificate doesn't come until after an entire

four-year program is completed.

3. Customize the courses based on the shop's specific processes. A general shop training curriculum isn't the best option for LeanWerks, because many of its repeating jobs involve specialized machining and manufacturing processes. The specific lessons within the custom courses it developed also serve to standardize processes, eliminating any person-to-person variation from the way the tasks are supposed to be performed.

4. Make use of video. Many lessons include instructional video taken of actual LeanWerks shopfloor processes and practices to clearly outline the steps required to complete a given task safely and effectively. To date, the shop has produced more than 130 such videos for its TExT program.

5. Simplify employee access and manager administration. An intuitive, Web-based platform makes it easy for employees to access lessons, as well as for the shop to manage the program, having the capability to prevent employees from proceeding to subsequent lessons until they have demonstrated a firm understanding of the material presented in the one they're currently studying. As it turns out, the cost of the software used to administer the program is relatively low, too. The program is based on a basic website-hosting platform modified with an inexpensive learning management system plug-in.

Mr. Leland says the program got a shot in the arm one year after LeanWerks began implementing it when the shop hired Paul Harbath to be its director of quality and continuous improvement. A 27-year manufacturing veteran with 14 years of lean-manufacturing consulting experience, Mr. Harbath has been key to helping develop TExT lessons, courses and instructional videos, and now serves as the program's administrator. During a recent visit, he and Mr. Leland explained what spurred the shop to develop its custom TExT training program, how it functions and what lies ahead in terms of its expected certification through the U.S. Department of Labor (DOL).

PROGRAM PATH

Mr. Leland started LeanWerks in 2003. His wife, Suzanna, is CEO and CFO. Although a large portion of the Ogden, Utah, company's business had been devoted to the oil and gas

industries, the contract shop has diversified itself by pursuing work for fluid power, defense, high-speed manufacturing and aerospace applications. In fact, Mr. Harbath led the shop's efforts last year to become registered to the AS9100C aerospace standard without any findings in the initial audit. The shop is also registered to ISO 9001:2008 and Directorate of Defense Trade Controls (DDTC), which is a prerequisite for International Traffic in Arms Regulations (ITAR) compliance.

As its name suggests, LeanWerks has made strides to establish a lean-manufacturing mindset, implementing practices such as 5S workplace organization, value stream mapping, kaizen events and cellular manufacturing. The goal is to wring as much waste as possible out of its production processes while fostering a culture of continuous improvement. The TExT program complements this approach in that it offers a streamlined means to train new employees based on the shop's own lean processes and procedures.

One of the first steps in creating the TExT program was finalizing the 10-level career path and identifying course segments. Each new hire begins with a shop fundamentals course that spans a 90-day introductory period and explains what LeanWerks and the TExT program are all about, in addition to introducing them to very basic shop concepts. It's at this stage that they sign a confidentiality agreement, too. In fact, that's the first "lesson" in that first course.

The introductory period benefits both the employee and the employer by enabling new hires to determine if a career in machining is something they truly want to pursue while affording the shop time to determine if the prospects are actually cut out for that type of work.

Those who pass this initial course receive a certificate of completion and are permitted to begin the career development portion of the program, which starts with the machine operator course. As shown in the screen capture on the facing page, this course is divided into a 10 lessons, and each of these covers a variety of topics. For example, topics inside the "Basics of Tooling" lesson address insert removal and replacement, mill and lathe offsets, touching-off tools, proper vending machine use, etc.

CONTINUED ON PAGE 20

Mr. Harbath says it typically takes a person six months to complete the machine operator course. The next course made available to him or her is senior operator, which takes nine months to one year to complete, followed by trainee change-over technician (one year),



change-over technician (1.5 years) and senior change-over technician (1.5 years). Although the shop allows anyone to proceed from trainee to senior change-over technician, a job opening is required to become a programmer, senior programmer, process engineer or senior process engineer.

The TExT program also includes courses for those who would like to become certified mechanical inspectors, quality technicians or quality engineers. In fact, all employees who enter the machine operator course must also take a CMM operator course, because they might at some point be required to inspect their own parts on the shop's CMM. Similarly, courses related to continuous improvement are offered, such as Six Sigma Green Belt, Black Belt and so on.

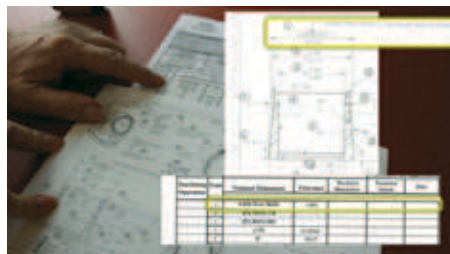
PROGRAM ADMINISTRATION

Mr. Harbath says that early on, TExT program administration was cumbersome, largely because it required manual management of complex spreadsheets for each employee. After some investigating, he eventually identified a more effective solution in Web-based software that was intuitive, easily customizable and very inexpensive.

LeanWerks chose WordPress, a popular website- and blog-hosting platform, so that it could create a TExT "training website," and then purchased a plug-in called LearnDash, which effectively turns WordPress into an online learning management system. The one-time cost for the LearnDash license was a mere \$130.

Using this as its platform meant documenting and presenting its curriculum was as simple as creating a website, although it more closely resembles a company Intranet. Employees can visit the password-protected TExT site at home or at work to access lessons that Mr. Harbath has made available to them. What's key is that

the program is set up that way so employees can't proceed to the next lesson in a course until they demonstrate complete understanding of the current one. This is accomplished applying the simple "I do, we do, you do" learning model, followed by a clear demonstration of the new skill to a senior member of the staff who signs off on a training form such as the one shown on the previous page. Once this completed form is scanned and uploaded to the learning management system, Mr. Harbath is notified and can allow the employee to access the subsequent lesson. This continues until all lessons within a course are completed, at which time Mr. Harbath allows access to the next course. LeanWerks lets apprentices study lessons on company time, but Mr. Harbath says that more of their time at the shop is dedicated to demonstrating their understanding of concepts on the shop floor rather than reviewing lessons.



Many of the course lessons feature shop-produced instructional videos related to parts, practices and processes that are specific to LeanWerks. For example, one lesson demonstrates how to properly braze carbide tips onto machined shafts in the assembly of oilfield choke valves. The cost to produce the initial batch of approximately 130 training videos wasn't high. The shop invested in a basic video camera and separate microphone, and hired an intern from nearby Weber State who was studying multimedia journalism to film and produce the videos over a span of six months. Videos are uploaded and accessed from Vimeo, a video sharing website. Mr. Harbath says the shop chose Vimeo for security purposes, because the training videos uploaded there can only be accessed through the TExT website. (See the top of this article for an example of one of the shop's training videos.)

What's nice is that the training videos provide value beyond "training." They also serve to standardize a given process. Documenting all the steps necessary to complete a task in a video leads to consistent processes without variability. This might not be the case with less formal training initiatives in which an apprentice shadows various people on the shop floor, each of whom might carry out a task differently. Plus, if a production problem arises, shop

personnel can always go back to the training video to verify that the proper procedures were followed.

It is also possible to provide LeanWerks' suppliers or customers with access to certain TExT videos. For instance, vendors can view videos showing how part inspection should be performed following the subcontracted work they were hired to perform. Similarly, in cases in which a customer has asked the shop to perform corrective actions for a given job, LeanWerks can not only present documentation proving that the corrective actions have been taken, but it can also provide the customer access to a video showing precisely how the shop changed its process to remedy the issue. These examples demonstrate the flexibility inherent to this Web- and video-based training platform.

NEXT STEPS: ACHIEVING DOL CERTIFICATION

In an attempt to further entice people to consider a career at LeanWerks, the shop is working with Weber State to combine TExT with a manufacturing engineering technology associate degree. This four-year program consists of 572 classroom hours at the university and 8,000 hours in TExT. In fact, LeanWerks will present this program to the DOL at the beginning of this year and expects its approval by mid-2016. This will mean employees embarking on this program will have the opportunity to earn DOL-recognizable and transferable certified journeyworker credentials, in addition to the associate degree.

LeanWerks is also a member of the National Tooling and Machining Association (NTMA), and Mr. Leland is trustee for its Northern Utah chapter. Last year, he approached the Governor's office requesting a \$150,000 grant to assist chapter members in developing machinist apprenticeship programs. The chapter won the grant, and Mr. Leland says it will also be used to launch what he foresees as being an ongoing marketing program among participating shops to generate public interest in manufacturing careers.

To date, 65 people have participated in the TExT program, although a few had to be let go during tough business conditions. However, Mr. Leland says LeanWerks is now looking to bring new candidates onboard, given that growth has returned as the shop continues to expand into new markets. He feels his shop's individual efforts in developing the TExT program combined with his NTMA chapter's marketing program will help his company attract and cultivate the type of quality shopfloor talent LeanWerks will need moving forward.



Meet Our National Associate Member:



MAKINO with Director of Marketing Mark Rentschler



Makino Director of Marketing Mark Rentschler

WHO IS MAKINO?

A world leader in advanced CNC machining centers, Makino is committed to providing high-performance, leading-edge machining technologies and innovative engineered process solutions that enable manufacturers to focus on making what matters. We offer a wide range of high-precision metal-cutting and EDM machinery, including horizontal machining centers, vertical machining centers, 5-axis

machining centers, graphite machining centers, and wire and sinker EDMs. Makino's flexible automation solutions provide reduced labor costs and increased throughput in a variety of production volumes and designs. Our engineering services offer industry-leading expertise for even the most challenging applications across all industries.

WHAT DREW MAKINO TO BECOME AN NTMA NATIONAL ASSOCIATE?

Clearly, the membership made of high precision machining shops is an audience Makino would like to be associated with. Furthermore, we knew we could learn from the membership, future product requirements and needed technologies and future areas of focus for our technology development.

WHAT PRODUCTS/SERVICES CAN MAKINO OFFER SPECIFICALLY TO NTMA MEMBERS?

Makino is the world's leader in horizontal machining centers. Also, our automation and engineering services can provide unique competitive advantages for your members when competing in the global market. This combination of high performance products and automation and process solutions, can truly make your members more profitable and productive.

WHAT INDUSTRY INITIATIVES DOES MAKINO SUPPORT?

We have supported the technology team, and any area of focus on precision machining.

WHERE CAN NTMA MEMBERS MEET MAKINO IN 2016?

We would encourage all members to visit with us at IMTS in 2016. There are also a variety of local events, seminars and regional trade shows where you can find Makino, such as MFG4 and Amerimold. Also please visit our local Single Source Technologies (SST) tech centers.

WHAT NEW IDEAS IS MAKINO SHARING WITH NTMA MEMBERS THIS YEAR?

Automation and real time production reporting will be big topics this year. We would encourage all members to talk with Makino to learn more about how Automation can improve their productivity, costs, quality and employee health and well-being. Furthermore, with the growth of the industrial internet, there will be rapid and powerful advances in how their business can benefit from this new technology. Also, we will be talking about our investment in long term customer support, regionalized service and more methods to get the help you need when you need it.

WHAT HAS MAKINO LEARNED FROM NTMA MEMBERS?

We have learned a great deal about the business pressures and demands that drive their innovation and creativity. We have learned about their relentless pursuit of process improvements and taking care of their customers. We learned how important trust, integrity and family are to so many of your members and how fortunate we are to be able to help an organization so dedicated to manufacturing here in the USA.

ONE LAST THING...

Investments in machines and a long term technology partner are important to each and every member. Take the time to examine Makino and understand how our machines, our engineering support and our service support can improve your company's performance and profitability. Look beyond the initial purchase price and truly understand operational costs and the contribution we can make to your business.



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WINNER SELECTED FOR MTCONNECT STUDENT CHALLENGE IDEA CREATION COMPETITION



Alexander Lee, a student at Central Piedmont Community College in Charlotte, NC, has been named the winner for the Idea Creation competition as part of the MTConnect Student Challenge for his submission, "Raspberry Pi for Data Visualization." Lee's winning submission proposed the use of a Raspberry Pi single-board computer as an MTConnect adapter to monitor a machine's overall equipment effectiveness, utilizing the Python programming language to visualize the data that comes from the machine.

"I'm part of a generation that grew up with the internet, and it was something that was always just there. But if you enter a factory today, it feels like the manufacturing industry kind of missed out on the whole internet revolution," Lee says. "I hope this award brings to light that there is a huge opportunity to innovate in manufacturing, and that kids who are using computers like Raspberry Pi will explore ways to use them in real-world industrial applications. A lot of millennials are entering the workforce, and they are enthusiastic to introduce these types of new and innovative ideas."

Lee's submission utilized an example of a manufacturing facility where engineers are required to manually record a machine's downtime through a legacy Sinumerek 840D controller, as the controller is not connected to any network. As a solution, a Raspberry Pi could be repurposed as an MTConnect adapter to collect data, with that data processed through MTConnect and the Python programming language and visualized through an open-source Python-based application. Lee has won a \$5,000 prize and has been invited to attend the upcoming [MC]2 Conference in Dallas along with the other competition winners. The finalists, along with their schools and titles of submissions, include:

- Steven Hearndon, Clemson – "MTMonitor (IFTTT Channel)" (\$2,500 winner)
- Zach DeSmit and Patrick Good, Virginia Tech – "Cyber-Attack Detection" (\$1,000 winner)
- Maxwell Micali, U.C. Berkeley – "Extracting Design from Data Streams" (\$1,000 winner)
- Ilya Kovalenko and Miguel Saez,

Michigan – "Multi-Agent Control of Manufacturing Systems" (\$1,000 winner)

"The MTConnect Institute is particularly excited about Alexander's winning proposal because of his innovative ideas for linking several open-source elements to address an industrywide need for better OEE data collection and visualization," says MTConnect President Douglas K. Woods. "By leveraging the low-cost Raspberry Pi along with Python, Alex has opened the doors to thousands of developers – especially those in the Maker Movement – to effectively connect, analyze, and visualize data from equipment, all made possible by the MTConnect standard."

The MTConnect Student Challenge seeks to better develop manufacturing's digital capabilities by using student creativ-

ity to find industry solutions. The challenge continues through July with the ongoing Application Development competition, which closes to submission on July 15. Winning submissions are eligible for a share of \$22,500 in cash prizes.

The MTConnect Student Challenge is sponsored by the Office of the Secretary of Defense (OSD) Defense-wide Manufacturing Science and Technology (DMS&T) and executed by the U.S. Army Benét Labs, the National Center for Defense Manufacturing and Machining (NCDMM), AMT and the MTConnect Institute, in partnership with SME and the NTMA.



EMPLOYEE MANAGEMENT & BENEFITS WORKSHOP, INDIANAPOLIS RECAP



Members from Ohio, Indiana, Missouri, Illinois and Connecticut gathered last month for the Employee Management & Benefits Workshop in Indianapolis. The workshop, hosted by Major Tool & Machine, included speakers from NTMA, McMahon Berger, and workshop sponsor CBIZ. Topics included Workforce Development, Multigenerational Management, Technology & Social Media Issues, Dealing with Conflict in the Workplace and a Legal Compliance Update/Trends in Health Care discussion.

"The Employee Management and Benefits Workshop was definitely a worthwhile event!" says Erika Marino, Human Resources Manager at Skamar Machine, Co. in Cleveland, OH. "I not only gained valuable information and tools to utilize, I was able to hear different perspectives



in the industry."

"I really enjoyed the Workshop," Danica Allen, HR Specialist from Ahaus Tool & Engineering. "As someone new to HR, the information was priceless. The speakers kept my attention with the stories they integrated into their presentations and they interacted with us, asking us questions/feedback. I am looking forward to the next one!"





2016 STEP AWARD HONOREES

The Manufacturing Institute honored 130 nationwide women with its Women in Manufacturing STEP (Science, Technology, Engineering and Production) Ahead Award.

The STEP Ahead Award is part of the larger STEP Ahead initiative by the institute designed to promote the role of women in the manufacturing industry. The award honors women representing all levels of the manufacturing industry who have demonstrated excellence and leadership in their careers. Here are the NTMA recipients for 2016:

TERI BLUMENTHAL

Plant Manager
Rockwell Automation
Ladysmith, WI

Teri Blumenthal has a 30-plus year career of nurturing people, growing the business, and developing as a dynamic leader at Rockwell. She has demonstrated exceptional skills in leading her staff at Rockwell's two main campuses in a range of progressively responsible positions, always keeping her teams focused, productive, and committed to both internal and external clients. Under her leadership, the facility has received a range of awards from state and local groups.

In addition to her daily responsibilities as plant manager, Teri has provided leadership through SAP implementations, new and existing business system enhancements, product launches, major facility expansions, and complex product manufacturing relocations. She has a strong connection to regional colleges, and believes in the importance of reaching students at a young age to spark interest and enthusiasm for a career in manufacturing.

JEZABEL CARDENAS

Environmental Health and Safety Manager
Rockwell Automation
Milwaukee, WI

Since joining the company in 2012, Jezabel systematically cultivated an Environment Health & Safety culture at both plants that promotes self-engagement based in safe behaviors at all levels of the organization. She engages employees to imprint safety as a way of living and engrain a safety mindset. Under her leadership the plants have earned a host of important certifications, as well as garnered the Prestigious Crystal Award for four years running.

Jezabel is committed to fostering the growth

of her female colleagues and recently volunteered to lead the new Professional Women's Council program in Monterrey to continue supporting other women in achieving their career goals. She is also a resource for students exploring career options, providing education and facilitating tours, in the hopes of educating and inspiring local talent.

CHERYL BUSH

Director, Global Strategic Pricing
Kennametal Inc.
Latrobe, PA

When Cheryl Bush joined Kennametal nine years ago, she brought with her the skills she honed from more than 15 years of experience engaging in leadership initiatives and promoting diversity in the workplace in her previous work. Recently, she was able to leverage her extensive experience in industrial manufacturing and Six Sigma™ to rapidly learn the variety of manufacturing processes across the global footprint of Kennametal and establish a process improvement program. By developing and conducting training, and coaching project leaders throughout the world, she was able to permanently enhance Kennametal's ability to meet customer needs and expand the culture of continuous improvement.

Cheryl was a natural fit for Kennametal's Inclusion work when she joined the company. She contributed to the establishment of mentoring guidelines and was a member of the team that proposed and launched the Kennametal Women's Leadership Development Conference, a developmental program focused on the unique needs of women's career and leadership growth.

MARCY MCCLANAHAN

Plant Manager and Site Leader
Ingersoll Rand
Charlotte, NC

Marcy McClanahan joined Ingersoll Rand more than 25 years ago and has been promoted to positions of increasing scope and responsibility. Currently Plant Manager and Site Leader at the Ingersoll Rand Remanufacturing Plant in Charlotte, N.C., Marcy is responsible for all plant functions generating \$50M in revenue annually.

Marcy is a certified Six Sigma Black Belt, and serves as a mentor for the Queens University Emerging Leaders program and is Co-Chairperson for the Ingersoll Rand PRIDE (LGBT) Employee Resource Group. She is very proud of the successful launch of the Ingersoll Rand Ally program, which helps

create a safe and supportive work environment for all employees.

JOANN MITCHELL

Senior Project Leader
Sandvik Coromant Company
Fair Lawn, NJ

JoAnn has been instrumental in the U.S. launch of the Metal Cutting Technology e-learning program, a program internationally nominated for excellence in manufacturing education, and provides this e-learning as a complimentary service to interested parties. She is an advocate of industry collaboration and works with several machine tool builders in developing industry-leading programs for students and teachers to help them acquire better skills.

JoAnn was the project leader for the first virtual field trip from the International Manufacturing Technology Show (IMTS). She has also been a key element of the company's outreach to the thousands of students who visit IMTS for every show, as well as an important part of the team that developed the program with The Manufacturing Institute to convert the benefits of the world's largest coin mosaic to a program with Dream It. Do It. to sponsor four Young Manufacturing Summer Academies.

ELISABETH SMITH

President
Acutec Precision Machining Inc.
Meadville, PA

Elisabeth Smith joined Acutec in June 2013 and transitioned into ownership as of June 2014, embracing the culture and taking the company from small to mid-size by maturing many internal processes while retaining the original philosophies.

Elisabeth works closely with personnel to ensure that their career aspirations are being met, and to create unique opportunities to foster engagement and interest, and ultimately increase retention. And she is actively focused on developing the pool of excellent candidates, including working closely with area universities to recruit and sponsors interns during the school year and during the summer.

Elisabeth is a sought-after speaker who has presented to educators and students at the 2015 ASM Materials Camp at Allegheny College, and has participated in several expert panels related to deployment of big data predictive analytics technologies in manufacturing for the NTMA and the University of Michigan.



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OPEN POSSIBILITIES





2015 NTMA Safety Award Winners

Colonial Machine Company	Akron	Warmelin Precision Products	Los Angeles
McAfee Tool & Die, Inc.	Akron	Wire Tech EDM, Inc.	Los Angeles
Reuther Mold & Mfg. Co.	Akron	United Tool and Engineering, Inc.	Michiana
Wagner Machine, Inc.	Akron	Advanced Tooling Specialists, Inc	Milwaukee
Continental Precision Inc	Arizona	Mahuta Tool Corp.	Milwaukee
Modern Industries Inc.	Arizona	H.H. Mercer, Inc.	North Texas
AccuRounds	Boston	Owens Machine and Tool	North Texas
Boston Centerless	Boston	Southern Machine Works	North Texas
Custom Group	Boston	JD Machine Corporation	Northern Utah
Fitz Machine Inc.	Boston	C&J Industries	Northwestern PA
North Easton Machine Co., Inc.	Boston	Highpoint Tool and Machine.	Northwestern PA
O-D Tool & Cutter, Inc.	Boston	Kuhn Tool & Die Co.	Northwestern PA
Cardinal Machine Co.	Cleveland	NuTec Tooling Systems, Inc.	Northwestern PA
Jergens, Inc.	Cleveland	Ripley Machine and Tool Company.	Northwestern PA
Jig Grinding Service	Cleveland	Shorts Tool & Mfg inc.	Northwestern PA
Kennick Mold and Die LLC	Cleveland	Tech Molded Plastics, Inc.	Northwestern PA
Rochester Manufacturing	Cleveland	Beaver Tool & Machine Co. Inc.	PA-Del Valley
Trec Industries, Inc.	Cleveland	Betar, Inc.	PA-Del Valley
Tri-Craft Inc.	Cleveland	DPI INC.	PA-Del Valley
Valley Tool & Die, Inc.	Cleveland	Rosenberger-Toth	PA-Del Valley
New England Die Co., Inc.	Connecticut	Cygnus Manufacturing Company, LLC	Pittsburgh
GEMCITY Engineering and Mfg.	Dayton TMA	EWT/3DCNC, Inc.	Rock River Valley
National Jet Co Inc.	General	BraTek Engineering	Rocky Mountain
Palma Tool & Die Co., Inc	General	Hirsh Precision Products, Inc.	Rocky Mountain
Stuart Tool & Die, Inc.	General	Mountainside Medical	Rocky Mountain
Trident Precision Manufacturing. Inc.	General	WESCO Laser Machining	Rocky Mountain
Win-Tech, Inc.	General	Diversified Tool & Die.	San Diego
The Lloyd Company.	Houston	BT Laser , Inc.	San Francisco Bay Area
Apex Tool & Manufacturing, Inc.	Indiana	R.M. Machining, Inc.	San Francisco Bay Area
Boyer Machine & Tool Co., Inc.	Indiana	ThermoFusion, Inc.	San Francisco Bay Area
Major Tool & Machine, Inc.	Indiana	Component Bar Products	St. Louis
Overton Industries	Indiana	Hellebusch Tool and Die, Inc.	St. Louis
C&R Manufacturing.	Kansas City	Homeyer Precision Manufacturing	St. Louis
Hans Rudolph, Inc.	Kansas City	Patterson Mold and Tool.	St. Louis
Dynamic Fabrication, Inc.	Los Angeles	Nolte Precise Manufacturing	Tri-State TMA
Hager Manufacturing. Inc.	Los Angeles	Obars Machine & Tool Co.	W Lake Erie
Moseys' Production Machinists, Inc.	Los Angeles		
Upland Fab, Inc.	Los Angeles		

The annual Safety Award identifies top-performing NTMA companies in the area of safety, based on survey responses submitted earlier this year. The survey incorporates data from OSHA Form 300A, Summary of Work-Related Injuries and Illnesses.

Congratulations, Safety Award winners!

APPRENTICESHIP TRAINING WITH THE NTMA-U SPRING SEMESTER



Apprenticeship is a system of worker training that has been around since skilled trades began, and although it has transitioned with advanced technology, it has stood the test of time. Our NTMA members have found a rebirth to apprenticeship as it has transitioned to help meet the growing demand for Workforce Development in our industry.

Few NTMA Members know what an apprenticeship entails, or what competencies are required for a potential employee needs to complete the BAT approved apprenticeship possesses. Apprenticeship is a set of standards required in on-the-job training and it is combined with classroom-based instruction. Traditional apprenticeships which require 8,000 hours of shop time and 576 hours of technical related training may not solve the workforce challenges of every member, but a certified and registered apprenticeship may have the potential to lead the workforce education and training systems.

The Department of Labor reported that there are 375,000 registered apprentices in the United States. By contrast, England

starts about 3 million apprentices per year. NTMA member companies are increasingly looking to develop stackable certificates that certify an employee on achieved ability to perform a specific set of skills. NIMS (National Institute of Metalworking Skills) have the potential to offer significant benefits to both workers and employers, but NIMS does not offer training. NTMA-U, however, is a recognized and certified DOL Precision Machine Apprenticeship training program. With 1,217 modules registered by NTMA members in this semester alone, NTMA-U is bridging the gap for a current method of training through online 24/7 access that matches today's computerized savvy generation. NTMA-U follows NIMS credentialing and it carries 21 Articulated College Credits to the University of Akron's Advanced Mechanical Engineering Technology degree. This degree can be completed online so you do not need to live close to the campus.


Today, NTMA members can offer a NIMS Certified Registered Apprenticeship Program just by enrolling into NTMA-U modules. Members can customize the ap-

prenticeship by adding competencies relevant to their own company as well as use a standard list of core competencies that is available from NTMA Vice President, Ken McCreight. Following course completion, an NTMA-U Apprenticeship certification confirms that an individual successfully passed a series of tests.

NTMA-U modules cost only \$199.00 per class topic, or 3 topics taken by the same student in the same semester for a total of \$449. A \$148.00 savings.

WEB-BASED MODULE TRAINING BEGINNING MAY 19, 2016

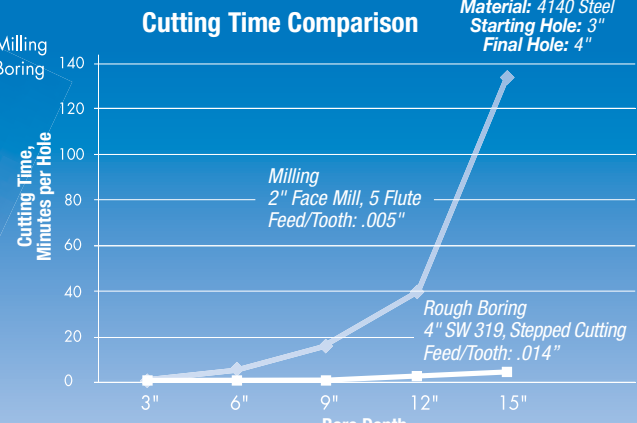
- Modules are self-paced and interactive.
- Each module takes approximately 30-40 hours to complete.
- Instruction, including quizzes, progressively test the user's understanding.
- Content introduces basic concepts, sound manufacturing practices, practical uses and key topics that are required to become successful in the manufacturing trade.
- Participants can earn 21 articulated education credits with the completion of 18 modules, Certified Journeyman's Status, and



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Cutting Time Comparison

Material: 4140 Steel
Starting Hole: 3"
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Bore Depth	Milling (Minutes per Hole)	Rough Boring (Minutes per Hole)
3"	~5	~5
6"	~10	~10
9"	~15	~15
12"	~40	~15
15"	~130	~20


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The new modules introduce a select training format for users, from the basics of manufacturing technology courses, to Advanced Manufacturing Procedures:

- NTMA 1000 Basic Math
- NTMA 1100 Basic Blueprint
- NTMA 1110 Basic Shop Technology
- NTMA 2110 Manufacturing Applied Intermediate Math/Intermediate Blueprint Reading
- NTMA 2200 Intermediate Shop Technology
- NTMA 3500 Manufacturing Technology Skills
- NTMA 3600 Master CAM
- NTMA 3700 Manufacturing Technology
- NTMA 4420 Specialty Materials

REDUCE COSTS: ONLINE TOOL TRACKS ELECTRICITY SUPPLIER PRICES BY UTILITY



How many electricity supplier prices do you compare when considering a supply contract? For an NTMA member that uses one million kilowatt hours of electricity annually, the cost difference between the highest and lowest supplier price could be thousands of dollars. If you evaluate only a few, how do you know if the supplier prices are high, low, or average? Since 2001, NTMA has endorsed consulting firm APPI Energy to identify the wide range of electricity supplier prices across the U.S. every day, and the lowest prices available from reliable, competing suppliers.

APPI Energy offers an online Price Finder tool that tracks electricity supplier prices. "In a three-step process that takes only a few minutes, NTMA members in deregulated energy markets in the U.S. can select their state and utility to view electricity price trends in their specific location," says Walter Moore, President and CEO of APPI Energy. The website then puts users in touch with an APPI Energy consultant ready to provide competitive price offers from multiple suppliers. NTMA members who are currently locked into an electricity supplier contract can use the Price Finder tool to take advantage of today's low energy prices in a contract that begins when their current contract expires.

Powered by the APPI Energy proprietary database that measures daily supplier prices, Price Finder displays average prices for electricity supply, determined across rate classes, contract start dates, and contract term lengths, for annual consumption up to one million kilowatt hours. APPI Energy can help you select a solution that best suits your business needs, based on location, load factor, and market timing.

Recommendations to NTMA members regarding when to buy energy, and which contract length is best, are based on extensive data analytics and 20 years of transaction experience. Price Finder is available online at www.appienergy.com/price-finder.



- NTMA 4600 CNC Programming Operations
- NTMA 4800 Quality Control – SPC / Inspection
- NTMA 5500 GDT
- NTMA 5210 Advanced Applied Math
- NTMA 5720 Advanced Manufacturing Technology
- NTMA 5901 Advanced Manufacturing Processes
- NTMA 6300 Diemaking
- NTMA 6410 Moldmaking
- NTMA 6500 Jig and Fixture
- NTMA 6800 Advanced Math II
- NTMA 7300 Diemaking

For more information, please contact Ken McCreight at kmccreight@ntma.org or 216-264-2834.



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May 20th

Workforce Development Roundtable,
California, PA

June 8th-10th

Emerging Leaders Conference, Chicago, IL

June 8th

Financial Managers Roundtable, Denver, CO

September 12th-17th

IMTS, Chicago, IL

September 28th

Sales & Marketing Workshop, Philadelphia, PA

October 11th

Financial Managers Roundtable, Charlotte, NC

October 12th-15th

Fall Conference, Charlotte, NC

October 26th

Plant Managers Roundtable, Boston, MA

November 2nd

Sales & Marketing Workshop, TBD

November 2nd-3rd

Supply Chain Network Fair, TBD

November 16th

Plant Managers Roundtable, Denver, CO

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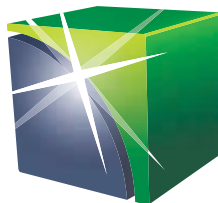
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THE RECORD

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EXPLORE SOLUTIONS,
MEET WITH EXPERTS, AND
FIND WAYS TO RATCHET
UP OUR ROUTINE.

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Vice President, Swiss Precision Machining, Inc.

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