Road Trip for Manufacturing Day

by Bob Zaruta, President/CEO, NWIRC

October flew by, but not without a flurry of activity promoting the industry for Manufacturing Day (Week and Month)! NWIRC’s key focus throughout the year is manufacturing, but it’s great to spend extra attention on the mission of showing students opportunities and the ‘cool’ factor of manufacturing.

In October’s newsletter, I focused on some small manufacturers I had the opportunity to meet in Kane, PA. I was able to continue my series of road trips throughout the region by spending some time in Clarion and Venango Counties for Manufacturing Day tours.

Kronospan / Clarion Industries

PA State Representative Donna Oberlander and I had the opportunity to tour Clarion Industries alongside students from Clarion County Career Center (CCCC). Plant Managers, Jim Confer (Boards) and Tim Reitz (Laminates), led the group through the facility focusing on automation at the sites and the wide-array of job opportunities throughout both plants. Confer told the students he started at the company years ago as a sander, and is now the manager of the Boards Plant. The students in the Construction Technology program at CCCC were engaged in learning about the products the company makes for the construction industry.

Time Machine

A group of Venango Technical Center (VTC) students joined PA State Representative Lee James and myself on a tour of Time Machine in Polk (Venango County) with host Cheryl Ferry, Time Machine Operations Director. The students, in programs ranging from computer aided drafting to machine tool technology, were able to see first-hand how the skills they are learning applies to a career at the company. Ferry said they are looking to build their workforce, so they offer options such as job shadowing, co-ops, and apprenticeships because they weren’t getting the talent just walking through the doors. She said that partnering with schools gives them a chance to show students the opportunities available and that Time Machine is a growing business.

Specialty Fabrication and Powder Coating (SFPC)

At SFPC, Rep. James and I were able to tour their 46,000 square foot facility in Franklin (Venango County) led by VP of Operations, Earl Lytle. He said SFPC has a great team of supervisors and individuals with specialty skills, and they have aggressively been investing in the business adding high-tech equipment (automation and robotics) to remain competitive in their markets, but there are still challenges. Throughout the tour, he mentioned one of their biggest needs is finding qualified welders and machinists. He said they can easily provide training, if they can find individuals interested in the manufacturing environment and the work the company is doing. The company uses different approaches to improve their workforce pipeline. They typically host 3-5 Venango Technical Center (VTC) welding students at any given time and they recently hired a new high school grad who they are training to work in various areas of the company.

As always, it was exciting to see the great things our regional manufacturers are doing, in terms of the products they make, the investments they are making in their companies and communities, and the way they are trying to inspire youth for the future.
4 Types of Robots Every Manufacturer Should Know
by Matt Minner, Catalyst Connection

There is a lot of buzz these days in the manufacturing sector about robots — and how they can help manufacturers address some of the challenges they face in today’s market, such as increased productivity and the scarcity of skilled workers.

But what exactly do analysts and automation experts mean when they use the word “robot?” And how can different types of robots improve an actual manufacturing operation? If you are a smaller manufacturer who is curious about robots but has never worked with them, it may be difficult to envision how robots might fit in to your facility. Here’s an overview of four types of industrial robots that every manufacturer should know.

1. Articulated Robots. An articulated robot is the type of robot that comes to mind when most people think about robots. Much like CNC mills, articulated robots are classified by the number of points of rotation or axes they have. The most common is the 6-axis articulated robot. There are also 4- and 7-axis units on the market.

   Flexibility, dexterity, and reach make articulated robots ideally suited for tasks that span non-parallel planes, such as machine tending. Articulated robots can also easily reach into a machine tool compartment and under obstructions to gain access to a workpiece (or even around an obstruction, in the case of a 7-axis robot).

   Sealed joints and protective sleeves allow articulated robots to excel in clean and dirty environments alike. The potential for mounting an articulated robot on any surface (e.g., a ceiling, a sliding rail) accommodates a wide range of working options.

   The sophistication of an articulated robot comes with a higher cost compared to other robot types with similar payloads. And articulated robots are less suited than other types of robots for very high-speed applications due to their more complex kinematics and relatively higher component mass.

2. SCARA Robots. A Selective Compliance Articulated Robot Arm (SCARA) is a good — and cost-effective — choice for performing operations between two parallel planes (e.g., transferring parts from a tray to a conveyor). SCARA robots excel at vertical assembly tasks such as inserting pins without binding due to their vertical rigidity.

   SCARA robots are lightweight and have small footprints, making them ideal for applications in crowded spaces. They are also capable of very fast cycle times.

   Due to their fixed swing arm design, which is an advantage in certain applications, SCARA robots face limitations when it comes to tasks that require working around or reaching inside objects such as fixtures, jigs, or machine tools within a work cell.

3. Delta Robots. Delta robots, also referred to as “spider robots,” use three base-mounted motors to actuate control arms that position the wrist. Basic delta robots are 3-axis units but 4- and 6-axis models are also available.

   By mounting the actuators on, or very close to, the stationary base instead of at each joint (as in the case of an articulated robot), a delta robot’s arm can be very lightweight. This allows for rapid movement which makes delta robots ideal for very high-speed operations involving light loads.

   An important thing to note as you compare delta robots to other robot types: Reach for delta robots is typically defined by the diameter of the working range, as opposed to the radius from the base, as in the case of articulated and SCARA units. For example, a delta robot with a 40” reach would only have half the reach (20” on a radius) of a 40” articulated or SCARA unit.

4. Cartesian Robots. Cartesian robots typically consist of three or more linear actuators assembled to fit a particular application. Positioned above a workspace, cartesian robots can be elevated to maximize floor space and accommodate a wide range of workpiece sizes. (When placed on an elevated structure suspended over two parallel rails, cartesian robots are referred to as “gantry robots.”)

   Cartesian robots typically use standard linear actuators and mounting brackets, minimizing the cost and complexity of any “custom” cartesian system. Higher capacity units can also be integrated with other robots (such as articulated robots) as “end-effectors” to increase system capabilities.

   That said, the custom nature of cartesian robots can make design, specification, and programming challenging or out of reach for smaller manufacturers intent on a “DIY” approach to robotics implementation. Cartesian robots are unable to reach into or around obstacles easily. And their exposed sliding mechanisms make them less suited for dusty/dirty environments.

Conclusion. Whether you’re tackling implementation yourself or working with a reputable systems integrator,
Continued from Page 2

knowing the different types of robots available will help you select the best machine. Knowing a little bit about the capabilities and costs associated with different robot types is a crucial first step toward making an informed decision.

This article originally appeared in Industry Week and the Manufacturing Innovation Blog. Matt Minner is a Senior Consultant for Technical Services at Catalyst Connection, part of the MEP National Network and one of seven PA Industrial Resource Centers.

Electric Materials: 2 Second Lean Brings Benefits for Customers and Employees

The Electric Materials Company (EM), in North East PA, is a manufacturer of metal products for industrial electrical applications. They provide custom engineered and manufactured products and services for the transportation, oil and gas, steel mill, power generation and distribution, mining, military, and nuclear industries. EM was planning to jumpstart efforts for improving their company culture with a focus on a lean environment. They had previous programs come and go, including ‘Quality Circles’, and others that had fizzled out. Leadership was looking for guidance on “initiating a culture change” and integrating the lean mindset. Their management team saw the benefits of being involved in NWIRC’s Lean Together™ working group for operational excellence and learning to apply 2 second improvements of their own, and listening to and seeing what others have tried. “The timing was epic,” said Patti Schwarz, Continuous Improvement and IT Manager. “I had recently been promoted to the position and was searching for local training resources to assist me in my new role.” EM also enrolled Rick Ramsdell, Production Manager and Tony Zimmerman, Engineering Supervisor. This team tailored what they learned to fit immediate needs within their departments.

Eventually they initiated a plan for a company-wide lean initiative involving specific departments and individuals. “One of the first things EM’s team did was to share the employee input and feedback with the core management team. The information did not fall on deaf ears,” said President, Becky Ramsdell.

One of the fundamentals of 2 Second Lean is to have regular stand-up meetings with employees. EM has weekly meetings in various departments, both in the office and shop floor, that include lots of employee participation, input, ideas, and feedback. Schwarz’s favorite aspect of the program is hearing from other companies about their progress, successes, and struggles. “That really put us at ease, because even though we are all on the same path, we go at different speeds, and we may vary our direction to get there,” she said. One of her key takeaways is “keeping it simple”. As far as the improvements they have made thus far, there have been many- from improving the appearance of their lobby to their EDM cell redesign for improving workflow and production. Schwarz noted that employees see there is action taken and have started offering more suggestions. “We are tracking two second improvements, which get posted on 2 boards for both office and shop areas,” she said. One 2 second improvement made a significant difference in their plating department production time and labor. That team determined a different way to load, clean, organize and reduce cycle time which enables them to deliver quality products in a faster turnaround time. One of EM’s largest customers for this area is pleased with response to their quick growth in orders, and so orders continue to increase. EM anticipates that being involved with Lean Together™ could produce an impact of at least $500K of increased sales and $1M in cost savings over the course of a year.

Side Note: A new Lean Together™ cohort is now forming to begin in January 2020. It’s an ongoing collaborative learning program focused on developing true and lasting cultural changes, where everyone’s job is making small incremental improvements—everyday. The program, created by NWIRC, includes nine monthly sessions of classroom education, facility tours, 2 Second Lean book discussions, and assignments. Contact Molly Reichard at (814) 217-6067 for more information.

Before (L) and After (R): For the bar washer, previously could only load 10-15 pieces per cycle. Now, using the same baskets used for plating, the process reduces having to transfer and can now load up to 60 pieces for each cycle and they go straight to plating afterwards.

Before (L) and After (R): In the IT department, devices would be loaned out with no tracking of who was taking them. Now, there is a sign-out whiteboard and items are stored in foam with labels so it’s obvious when something is out on loan.

Eventually they initiated a plan for a company-wide lean initiative involving specific departments and individuals. “One of the first things EM’s team did was to share the employee input...
For more information or to register for training, visit www.nwirc.org

YOUR STRATEGIC BUSINESS ADVISORS

If you have questions, or would like to speak with someone from NWIRC about services, please contact your Strategic Business Advisor (SBA):

Tom Weible
814.590.5202
Cameron, Clearfield, Elk, Jefferson, McKean & Potter Counties

Susan Hileman
814.572.2077
Forest, Mercer, Venango, Clarion Counties & Titusville

Lisa Pustelak
814.683.1034
Crawford, Warren Counties, Corry & Edinboro

Andrew Idzik
814.217.6068
Erie County & Bradford

For more information or to register for training, visit www.nwirc.org

HAPPY THANKSGIVING!

UPCOMING EVENTS

Measurement System Analysis
Nov 7
Location: Erie
As another tool for quality management, participants will learn the concept for assessing, measuring, and improving the reliability of their measurement system. You will review different sources of measurement variation and techniques to identify, isolate, and reduce measurement variation.

ISO 9001:2015 Internal Auditor
Nov 19-21
Location: St Marys
The 3-day course provides a detailed review of the ISO 9001:2015 quality standard. Participants will learn how to conduct an audit, write the audit report, take corrective actions and more.

Root Cause Analysis
Jan 9
Location: St Marys
Discover a disciplined approach to problem solving. Once a root cause is identified and remedied, final system outcomes improve-preventing it from occurring again. Learn how to clearly define a problem, develop sampling strategy, collect data, use analytical tools, and strategies to improve a process.

IATF 16949:2016 Internal Auditor
Jan 14-16
Location: St Marys & Erie
Training of the IATF 16949 automotive standard will provide understanding of quality management principles in context with ISO 9001:2015, along with techniques of process-based auditing with hands-on activities.