NIST MEP’s 2015 Small Manufacturer Robotics Workshop
by Bob Bengel, NWIRC President/CEO

A new vision for U. S. manufacturing is emerging to strengthen U. S. competitiveness in the face of global trends. This vision is driving manufacturers towards dramatically greater responsiveness and innovation in their enterprises. Due to their inherent flexibility and reusability, robotic systems are an essential part of achieving this vision. To succeed, robotic systems need to be highly-capable, perceptive, dexterous, mobile systems that can operate safely in collaboration with humans or other robots, are easily tasked and re-tasked, and can be integrated into the rest of the enterprise seamlessly and quickly.

Last month, the Manufacturing Extension Partnership (MEP) partnered with the National Institute of Standards and Technology’s (NIST) Engineering Lab to hold the first ever Small Manufacturer Robotic Workshop. The workshop, which was held in Columbia, Maryland, was designed to identify and help reduce the barriers that small and medium-sized manufacturers encounter when introducing robotics into their operations.

In the short-term, the manufacturers who participated in the workshop had the opportunity to tour state-of-the-art NIST robotics research facilities and gain insights into trends, cutting edge tools, and emerging robotics technologies. Longer term, MEP intends for small and medium-sized manufacturers to have the opportunity to:

- Contribute to the development of performance requirements, robotics standards, and authoritative technical guidelines that impact robotic implementations within small and medium-sized manufacturers;
- Learn how other small and medium-sized manufacturers have been able to address and overcome the challenges of integrating robotics into their manufacturing processes;
- Explore long-term collaboration opportunities with NIST’s Engineering Lab, and;
- Gain future access to NIST’s robotics test beds that deploy state-of-the-art technologies, advanced sensor systems, and cutting edge manufacturing application research.

Contact your local NWIRC Strategic Business Advisor to obtain expert advice and support for your robotics implementations and other advanced manufacturing technology needs.

TechFest Benefits for Manufacturers

Manufacturing Day 2015 is history, but Northwest Pennsylvania manufacturers will again be in the spotlight as TechFest approaches.

The two-day event has a focus for both industry and students. Manufacturers will find three core benefits, including:

1) information through education programs and exhibits, 2) networking, and 3) promoting the industry and their company.

TechFest: Manufacturing Technology Days will be held on December 9th and 10th at Erie’s Bayfront Convention Center. The first day (Dec 9) is Industry Day with a focus on manufacturers. Education and exhibits will be held from 10:30am-5:30pm, a networking reception from 4-6pm and dinner with keynote speaker at 6pm. Exhibits and education will include: 1) machine and software technology trade show, 2) breakout sessions focusing on technology innovation, human resources, and manufacturing IT, 3) robotic demonstrations, 4) 3-D printing demonstrations, and

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TechFest (Continued from page 1)

5) training and development information for new and incumbent workers. The Industry Day dinner for manufacturers features keynote speaker Will Knecht, President of Wendell August Forge in Grove City, PA.

On Student Day (Dec 10), participants will visit exhibits, interactive presentations, and be energized over the lunch-hour by Jeremy Bout, Producer and Host of the Edge Factor. Bout pushes the limits with his creative vision and digital expertise to create high-impact media. Edge Factor is changing the perception of manufacturing careers and engaging students through a TV Series, eduFactor, and large stage events.

Major sponsors of TechFest include Northwest Industrial Resource Center (NWIRC), Northwestern PA National Tooling and Machining Association (NWPA NTMA), Advanced Diversified Manufacturing Industry Partnership (ADMIP), and Ainsworth Pet Nutrition. Register for the event at www.madeinnwpa.org/techfest.

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CYBERSECURITY SERIES

NWIRC continues a series of articles by guest writers who are experts in various areas of cybersecurity.

Part 3: The Great Convergence: When Shop Floor Level Data Needs Enterprise Level Security

By Scott McCausland, MBA
Process and Data Automation

Cybersecurity attacks against industrial companies are nothing new; however, with stealthy and more sophisticated methods aimed directly at the plant floor, it is time for a more serious approach to information security.

Recent data breaches against multiple major companies have brought cybersecurity into the forefront of information technology departments across the globe. With the proliferation of “smart” devices, and the volume of data that can be collected and analyzed, access to this information is becoming more valuable and thus, more appealing to perpetrators.

There are multiple strategies to employ when discussing cybersecurity at the floor level, and here are four of the most important:

1) Network Segmentation – segmentation of industrial networks from office networks by making them islands with specific conduits of communication - preventing unauthorized access to automated control systems and data collection repositories, and decreasing overall network traffic, improving performance

2) Peripherals Security – limiting the use of portable storage devices on the plant floor will reduce thumbsucking attacks, where a perpetrator will use a “thumb” drive to breach the system and gain control access

3) Log Activity – collecting detailed activity logs – data regarding who, what, when, and where, can lead to detailed tracing of security weaknesses and visibility of unauthorized attacks, especially in the event of silent infiltrations

4) Defense in Depth – deploy multiple security countermeasures in a layered architecture. Policies requiring secure VPN access, deployment of network firewalls, and implementation of role-based access control stacks security layer on top of security layer

These strategies are not difficult to implement, but they require enterprise support from the top down. The development of security policies and procedures enable organizations to follow a consistent program for maintaining an acceptable level of industrial security. Post-event preparation, by definition, means the damage is already done, don’t put off till tomorrow, what could save you today. Process and Data Automation’s Data Services Group has experienced and certified network security professionals available to consult on security implementation strategies.

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ISO 9001:2015 Published

The revised ISO 9001:2015 for Quality Management was published on September 23rd. Manufacturers who are currently certified as ISO 9001:2008 or those looking to become certified, will need to consider the transition, implementation, and auditing under the new requirements.

Robotics Improve Operations for Small Manufacturers
by Michael Griffith
Manufacturing Technology Engineer, NWIRC

Owning and managing a manufacturing business presents ever-changing challenges. Suppliers, customers, employees and other stakeholders can pull an owner or manager in many directions, but available constancy may be in the form of a collaborative robot. Collaborative robotics is becoming more widely available, affordable, and flexible to meet the needs of small manufacturers for a multitude of applications. This emerging technology is rapidly evolving and geared to improve accuracy, consistency, and quality.

Industrial robotic systems, common on automotive factory lines and in welding applications, have been around for decades. These fixed robotic systems, which are task specific; caged off from human interaction; and expensive to repurpose at the end of a product’s life cycle, are of little use to small manufacturers where processes can change frequently.

Conversely, collaborative or flexible robotics are designed to potentially work alongside humans. They are safe; accurate and consistent; easy to program, operate, and maintain; and can be affordably re-tooled for a new operation. Improved robotic technology has led to a 29% increase in worldwide sales of robotics from 2013 to 2014. Automotive and electrical/electronics manufacturers continue to drive this global increase in sales. However, as technology improves, costs decrease, and robotic speed and productivity increase, applications for small manufacturers broaden. Boston Consulting Group estimates that due to improved performance and falling costs, annual unit sales could double by 2025.

Small manufacturers, including those in fabricated metal products, chemicals, plastics, foods and others, are currently employing these flexible robots to perform applications such as:

- Pick and place raw material for an operation
- Remove, transfer, inspect, and stack or pack material after an operation has been performed
- Kitting parts to be assembled
- Small parts assembly
- Other material handling, including robotic lift assist or mobile robots moving material from warehouse to staging through production and on to shipping

Benefits of integrating robotics into a manufacturing operation can include increased throughput, reduced operating costs, reduced production downtime, improved quality and in some cases an improved process, either with or without automation. The greatest benefit of implementing robotics can be shifting employees from repetitive, tedious or hazardous tasks to more value-added operations.

Major manufacturers of collaborative robots include KUKA, Universal Robotics, Rethink Robotics, ABB and Fanuc. Although the price of a base robot, such as Rethink Robotics “Baxter”, can start at $25,000, the total cost of ownership can be three to nine times as much of the base price. Additional safety measures, sensing, tooling, system integration, training, validation and maintenance costs all add to the base robot price. Calculating this total cost of ownership is important when considering whether a robotics system is financially feasible.

The National Institute for Standards and Technology Manufacturing Extension Partnership (NIST MEP) / NIST Engineering Labs recently hosted a Collaborative Robotics Workshop for Small Manufacturers. This workshop brought together small manufacturers from across the county, automation service providers, and NIST representatives to discuss small manufacturers’ needs and barriers regarding robotics implementation, and how to collectively overcome these barriers to improve operations. The outcome of the workshop will be a framework to increase performance of robotics offering long-term benefits for small manufacturers.

Contact your NWIRC Strategic Business Advisor to learn more about collaborative robotics and the impact these systems can have on your operations.

1 http://www.ifr.org/industrial-robots/statistics
2 https://www.bcgperspectives.com/content/articles/lean-manufacturing-innovation-robots-redefine-competitiveness/

Manufacturing in the Region: Industry Luncheon

The NWIRC and St Marys Chamber of Commerce will host a luncheon for manufacturers on Tuesday, November 24 from 11:30-1:00pm at The Highlands in St Marys, PA. The event will feature special guest Congressman Glenn ‘GT’ Thompson of the 5th District providing updates on federal policy affecting Pennsylvania industry. Economic development partners will also provide a briefing on new programs.

The luncheon is $10 per person and seating is limited. Please register at www.nwirc.org/events/industrylunch.
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:

Tom Weible  
814.590.5202  
Cameron, Clarion, Clearfield, Elk  
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Susan Hileman  
814.572.2077  
Crawford, Forest, Mercer &  
Venango Counties

Ed Barthelmes  
814.923.3084  
Erie & Warren Counties

UPCOMING EVENTS

Failure Modes & Effects Analysis  
November 12  
Location: Hermitage  
A failure modes and effects analysis (FMEA) helps analyze a proposed or existing process or product to uncover potential failures within the product, process, or system before they occur. Gain a working knowledge of the FMEA process for products, processes, or systems in this one-day class.

Root Cause Analysis  
November 19  
Location: DuBois  
Root Cause Analysis (RCA) is a methodology for finding and correcting the most important reasons for performance problems. Don't just put a bandage on a problem - discover a disciplined approach to problem solving.

ISO/TS 16949 Audit Training  
December 1-3  
Location: Erie  
Through a combination of lecture, discussion and auditing case studies, participants will develop skills for identifying non-conformance and promoting continual improvement within their service or manufacturing organization. Learn how to perform ISO/TS 16949 internal audits by attending this 3-day course.

Morning Huddle: R&E Tax Credits  
December 15  
Location: Erie  
Are you overlooking the Credit for Increasing Research Activities, commonly referred to as the “R&E Tax Credit?” Many companies don’t realize their efforts, time, and resources can be used to reduce the tax burden. This 90-minute session will provide the information you need to take advantage of this benefit.