electroindustry

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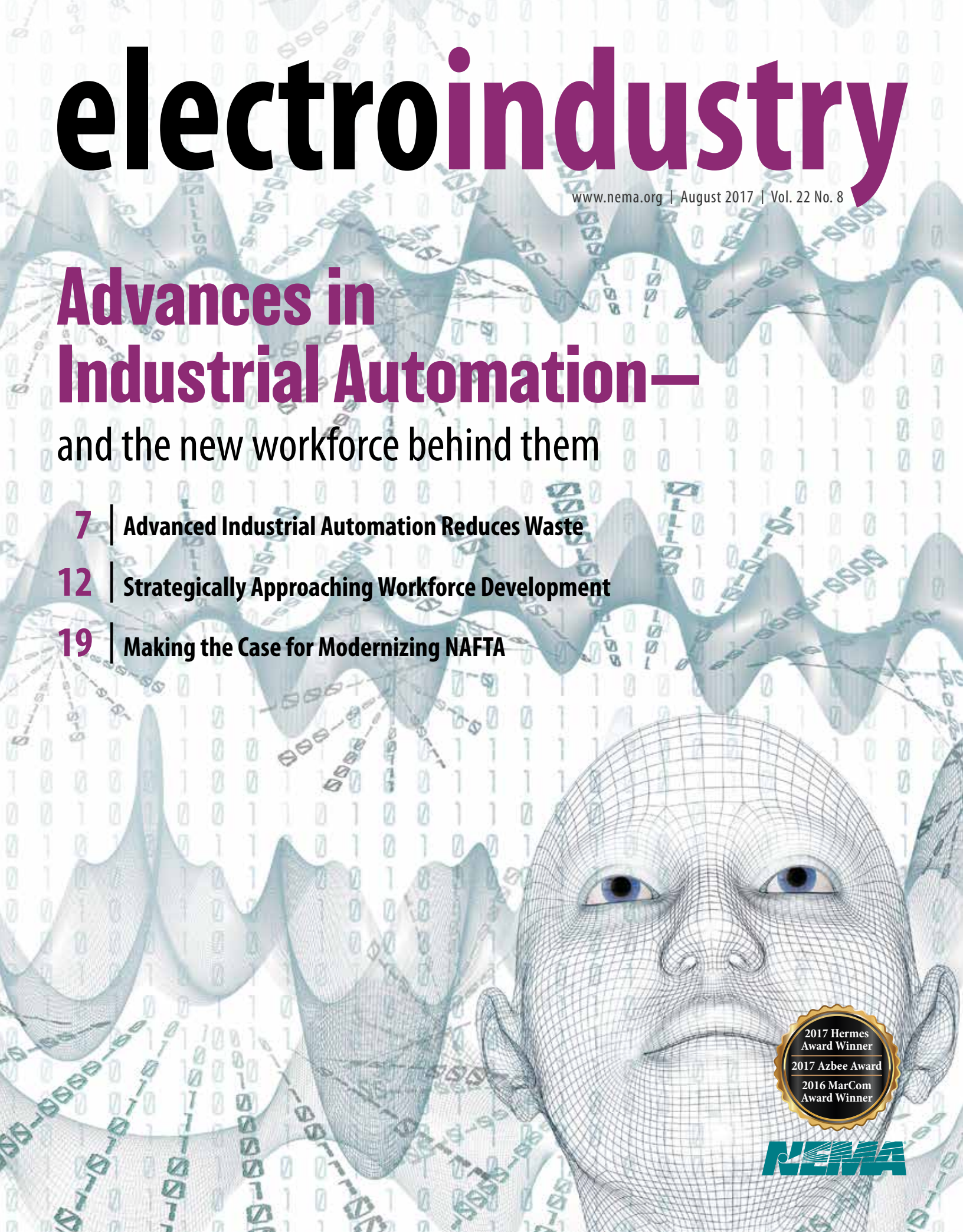
Advances in Industrial Automation—

and the new workforce behind them



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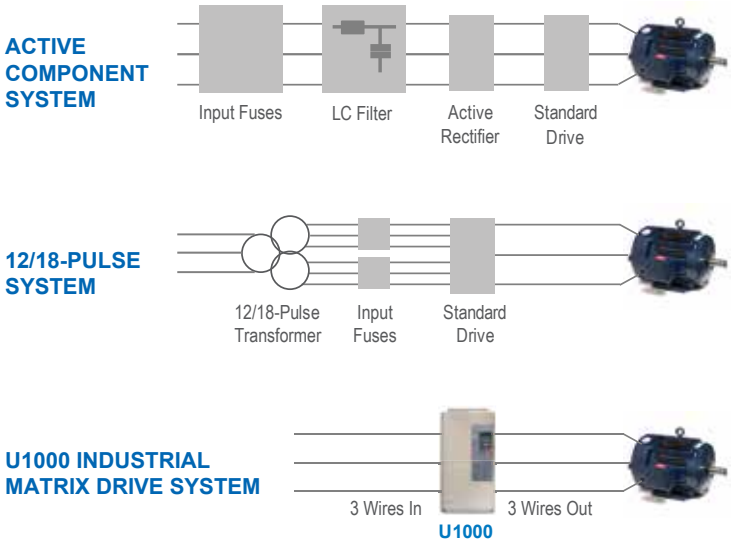

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FROM THE **CHAIRMAN**

The Internet of Things is impacting the entire electrical industry and changing how products are manufactured. One of the greatest challenges NEMA Member companies face is a growing shortage of available, qualified workers with the essential skills for this new manufacturing era. There is tremendous opportunity for high-tech products that easily integrate with the expanding Internet of Things, but the development and manufacture of those products rely on a skilled workforce along with effective recruiting and training strategies for qualified candidates.

The current gap includes positions from entry-level employees to electrical technicians with post-secondary, skill-based education and experience. As NEMA Members, we have the opportunity to effectively identify the positions with the greatest need and to influence the types of skills that should be learned in high-school vocational-technical programs, trade, and college curricula.

This is such an important and pressing issue that NEMA identified Workforce Development as part of its 2017 Strategic Initiatives with a goal of systematically mapping the workforce needs of NEMA Member companies. The goal of this initiative is to ensure NEMA Members have sufficient access to well-educated, highly motivated, properly trained employees.

In each of my columns, I have invited and encouraged NEMA Members to get involved in NEMA committees and councils critical for supporting proper standards and protocols. This is especially important with regard to workforce development. Your input can assist us in identifying skill gaps and areas with the greatest demonstrated need for young employees who can help us meet growing manufacturing demands. You can provide detailed information on the type of coursework or training that needs to be included in technical programs at the high-school and post-secondary level. A shrinking employee pool affects every NEMA Member and the future of the U.S. manufacturing industry.

Workforce Development is just one of our 2017 Strategic Initiatives; others include the Internet of Things, Market Development, Smart Cities, and the Value of Medical Imaging. In 2018, NEMA will likely focus on networked manufacturing systems and digital enterprise platforms that drive higher manufacturing productivity, attract new talent, and help manufacturers more effectively implement digitalization.

Take the opportunity to make your voice heard and get involved. Together, we can make sure the electrical manufacturing industry stays ahead of the curve and continues to provide products and solutions that make everyone's lives better.

Michael Pessina
Chairman, NEMA Board of Governors

officers

Register now for the Annual Membership Meeting, November 8-10, at the Hyatt Regency Coconut Point.

www.nema.org/annual-meeting
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Congressman Glenn "GT" Thompson
(R-PA)

No-Brainer: Strengthen Technical Education Now

On June 26, 2017, the U.S. House of Representatives unanimously approved HR 2353, the Strengthening Career and Technical Education for the 21st Century Act. I helped author and introduce this bipartisan bill to increase access to high-quality career and technical education (CTE), opening the door for more Americans to achieve success in today's workforce.

Congressman GT Thompson represents Pennsylvania's Fifth Congressional District. He chairs the House Subcommittee on Nutrition, co-chairs the House Career and Technical Education Caucus, is senior member of the House Committee on Education and the Workforce, and serves on the House Natural Resources Committee.

It's not every day that Republicans and Democrats agree on labor or education issues—some would call it a rare occasion. However, I am proud to say that lawmakers, educators, and industry leaders have come together to make our nation more competitive in this cutting-edge, global economy.

As co-chair of the House Career and Technical Education Caucus and senior member of the House Committee on Education and the Workforce, I know that many employers face a hiring crisis too serious to ignore. According to *U.S. News & World Report*, during the 2014–15 school year, our nation graduated 30,000 science, technology, engineering, and math (STEM) students to fill 230,000 STEM-related jobs. Additionally, more than one million positions remain open in the trade, transportation, and utilities sectors, and 315,000 manufacturing positions are currently unfilled. If we are to embark on a new era of American manufacturing and improved infrastructure, we must realize the importance of a qualified and well-trained workforce.

With 45 million Americans currently living below the poverty line and the average college graduate owing $37,000 or more in student loans, federal legislation aimed at strengthening and expanding CTE programs is a no-brainer. This legislation will not only help meet the needs of 21st-century employers but also empower students to make educated decisions about their futures and provide them with the tools they need to be competitive.

This bill is crucial to removing barriers to technical education, including the stigma that young people have faced in settings that encourage hands-on learning. We must remove this outdated notion from the national dialogue and recognize that the dynamics of our economy are changing—and our workforce must change with it.

With this in mind, my colleagues and I looked at the federal laws governing career and technical education, which have not been updated since 2006. We worked in conjunction with dedicated stakeholders to produce a well-engineered reauthorization bill that will help to ensure that the skills taught in our high schools and community colleges result in real jobs.

HR 2353 will accomplish this by giving states and localities the flexibility to tailor career and technical education to their local economies and the jobs most in demand. To supplement these efforts, the bill authorizes more than $7 billion from fiscal years 2018 through 2023 for U.S. Department of Education (ED) grants to states. In return, states would develop programs of study and submit their plans to ED. These plans would include clear performance goals, such as a summary of workforce development activities; a strategic vision and goals for preparing an educated and skilled workforce meeting the needs of employers; how the state will support the recruitment and preparation of teachers; and a description of how federal funds will be spent.

Encouraged by the broad bipartisan support this legislation received on the House floor, I look forward to its consideration in the Senate. We must seize the opportunity to improve the lives of students, workers, and employers by making CTE programs a priority—this bill is only the beginning.


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Congressman Peters Recognized by NEMA Leaders

Representative Scott H. Peters (D-CA) discussed energy issues with the NEMA Board of Governors at its July meeting and was recognized by NEMA's Medical Imaging & Technology Alliance (MITA) for his support of consistent medical device servicing requirements and improving access to cutting-edge diagnostic imaging innovation. Congressman Peters, who represents California's fifty-second Congressional District, chairs the Sustainable Energy & Environment Caucus Climate Task Force and is a member of the Congressional STEM Education Caucus.

Congressman Peters (left) is welcomed by NEMA Vice President for Government Relations Kyle Pitsor, Chairman of the NEMA Board of Governors Michael Pessina, and NEMA President and CEO Kevin Cosgriff. Photo by Tracy Cullen

At its July meeting, the MITA Board of Directors presented Congressman Peters with a 2017 Legislator of the Year Award. Congratulating him were (from the left) Dennis Durmis of Bayer Healthcare, Tiffany Olson of Cardinal Health, Sheldon Schaffer of Hitachi Healthcare Americas, Eric Stahre of GE Healthcare, Neo Imai of Canon Healthcare Solutions, Board Chair Joe Robinson of Philips Healthcare, Michael Wendt of Siemens Healthineers, and Paul Biggins of Toshiba America Medical Systems. Photo by Peter Weems

New Members

NEMA welcomes the following new members.

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X-Ray Imaging Products Section

R.E. Uptegraff Manufacturing Co. LLC
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Transformers Products Section
Dry-Type & Specialty Transformer Group
Transformer Group

Sensus, a Xylem Brand
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Electrical Measuring Equipment Section
Electrical Metering Group

Theragnostics, Inc.
www.theragnostics.com
PET Working Group

Hot Diggity Dog!

Advanced Industrial Automation Improves Compliance, Reduces Waste

Photo courtesy of Rockwell Automation

Since the invention of the corn dog in 1930, Americans have fostered a genuine love for food on a stick. Hillshire Brands, a leader in packaged meat and bakery production owned by Tyson Foods, is at the forefront of these innovative food products.

The Hillshire plant in Haltom City, Texas, produces 58 varieties of meals on a stick. The products are cooked, put through the "sticking" process, dipped in batter, fried, and then frozen in a continuous-process line. The products are then packaged before they are sent to a connected mixing center for distribution. The Haltom City plant rolls out a whopping 2.8 million corn dogs each day.

Any food supplier has to keep food safety top of mind, especially with the 2015 implementation of new regulations under the Food Safety Modernization Act (FSMA), which is overseen by the Food and Drug Administration (FDA).

The FSMA requires food suppliers in the United States to focus on preventing contamination rather than responding to it. Additionally, with raw-materials costs for food products on the rise, suppliers need to find ways to ensure product quality while also maintaining plant efficiency and yield.

The Challenge

Faced with new FSMA requirements, Hillshire also realized a business need to improve production monitoring and efficiency. A single day of refrigeration-system downtime can cost the company $120,000 in raw-material losses, before labor costs are included. The plant's old utility system that monitored refrigeration was outdated and obsolete. Operators faced temperature deviations without knowing the risks to food safety and product quality or having access to real-time updates.

Yet another challenge arose from the large number of product variations and changeovers on the plant floor each day. Changes in product variations impacted other variables, including fry times, cooking temperatures, and raw-materials combinations and amounts.

"We were seeing the plant get out of balance as product flowed at uneven or unforeseen rates from our meat area to the kitchen to the packaging area," said Harvey Williams, manager for Hillshire's Haltom City plant.

Mary Burgoon, Market Development Manager, Rockwell Automation

Ms. Burgoon is responsible for leading the development and implementation of strategies and programs that address customer challenges with innovative industry solutions.

Energy Management for Intelligent Manufacturing

Schneider Electric's Lexington, Kentucky, manufacturing facility paint production area

Knowing how process energy (i.e., the power needed to manufacture finished products) affects manufacturing and then increasing the intelligence behind it are keys to improving overall energy use and operational efficiency.

Schneider Electric implemented a process-energy monitoring and control system for its electrical enclosure paint process. The monitoring system uses energy data along with power quality information to communicate with the paint process's programmable logic control systems to

- identify and optimize energy usage by process;
- identify operational anomalies;
- determine energy consumption by product; and
- identify energy anomalies.

Results include increased production, increased equipment life, improved maintainability, and reduction of overtime costs. Two additional key lessons learned: there is significant return on investment when energy costs are optimized, and the system provides a solid framework for compliance with ISO 50001 *Energy Management Standard.*

Keith Waters, PE, CEM, Manager, Industry Standards, Schneider Electric North America

Continued from page 7

Quality deviations and wasted product can occur if process variables are not changed for a new recipe or if the downstream area of production is not prepared for an increased or reduced timeframe that comes with a new recipe.

During one deviation in the hot dog cooking area, Mr. Williams was alerted to a cooker fault after a shift concluded. To get to the root problem, he looped in two value-stream managers and the quality assurance manager. They had to look through manually entered operator data on water temperature from the entire shift to determine when the cooker faulted and decide how much and which product needed to be thrown out. Hillshire needed a solution to reduce the variability in the production process while still complying with the FSMA.

The lack of visibility and real-time reporting during production led to an increased amount of inedible product and posed potential food safety compliance risks.

"With our inedible rates reaching over 1.6 percent, we needed a solution beyond end-of-shift Excel® reports that told us how much waste occurred," Mr. Williams said. "We needed something that could give our value-stream managers a view into process variability across the plant to reduce the amount of inedible, wasted product."

The Solution

Mr. Williams turned to Rockwell Automation for a manufacturing intelligence solution. Similar software was in use at several other Hillshire plants. He selected a software suite that integrated the control system, software, and use of the EtherNet/IP™ network to provide the necessary monitoring and tracking for the plant's utility system. The solution was scalable enough to offer plant-wide insight on issues that occur in each area of production during changeovers to improve efficiency and product quality.

Historian software automatically identifies, gathers, and stores production data from the control system. It aggregates this data with information from the enterprise resource planning system and other plant databases and systems, correlates it, and presents production information to operations, so variances are easily identified and corrected in real time. For example, the system has been set up to pull specific information from a fryer; recording the temperature at various levels and locations within the fryer ensures that all products are cooked evenly.

This information is displayed in a dashboard so an operator can view all the active fryers at once or drill down into one specific fryer if an alert is noted. If a new fryer is added to the line, it can be added to the dashboard in a matter of minutes, copying over the existing tags and the related key performance indicators (KPIs) developed for the other fryers.

Results

The Haltom City plant can monitor approximately 1,500 data points across cooking, sticking, battering, frying, freezing, and packaging. Additionally, the team has extended this solution with tablets running a KPI mobile app. Operators and value-stream managers on the floor can monitor any area of production—packaging status, cook temperature, and frying capacity—in the palms of their hands.

Armed with anytime access to real-time and historical production data and trends, operators can see where there are problems, where problems might arise, and where additional capacity exists to increase production or run an alternative product.

When new regulations under the FSMA were fully implemented in 2015, the software was essential in improving traceability and reporting for the FDA.

The increase in data collected, reported, and shared helps the plant track exact serial numbers, date, and time-stamped details on which stock-keeping units (SKU) numbers came off each specific line. If the plant ever has a problem with food safety, alerts are in place that allow managers to immediately pull up data to check how many cases may have been affected and their specific product serial numbers. Mobilizing the solution unties area managers from the machine or control-room monitors, allowing them to better manage their zones and collaborate across production zones.

"Our value-stream managers no longer have to wait for Excel-style, manual reporting at the end of each shift to make production decisions," Mr. Williams said. "Managers can show summarized, contextualized information on the tablet directly to the operators on the plant floor. Those teams can now immediately see how their actions are affecting quality-assurance goals. Understanding these cause–effect relationships has been revolutionary for our teams. We are seeing functions work more collaboratively toward higher-level plant goals rather than focusing on the individual goals that only impact their area of production."

This deeper insight has helped Hillshire decrease inedible product and waste goals at the plant to 0.8 percent, which translates into savings of nearly 5.5 million corn dogs annually.

Mitsubishi Electric Takes on Manufacturing Challenges

Manufacturers in America have two large challenges that have the potential to impede their ability to succeed. The challenges are the lack of skilled labor to replace the aging workforce and competition with lower labor costs overseas.

At Mitsubishi Electric, industrial automation addresses these challenges by

- allowing customers to drive down the cost of labor, reducing manufacturing costs;
- operating with a high level of speed and precision, allowing machines to produce a better quality product; and
- enabling collaboration between humans and robots so that they can work in close proximity to each other while creating a safe work environment.

Sloan Zupan, Senior Corporate Marketing Manager, Mitsubishi Electric Automation, Inc.

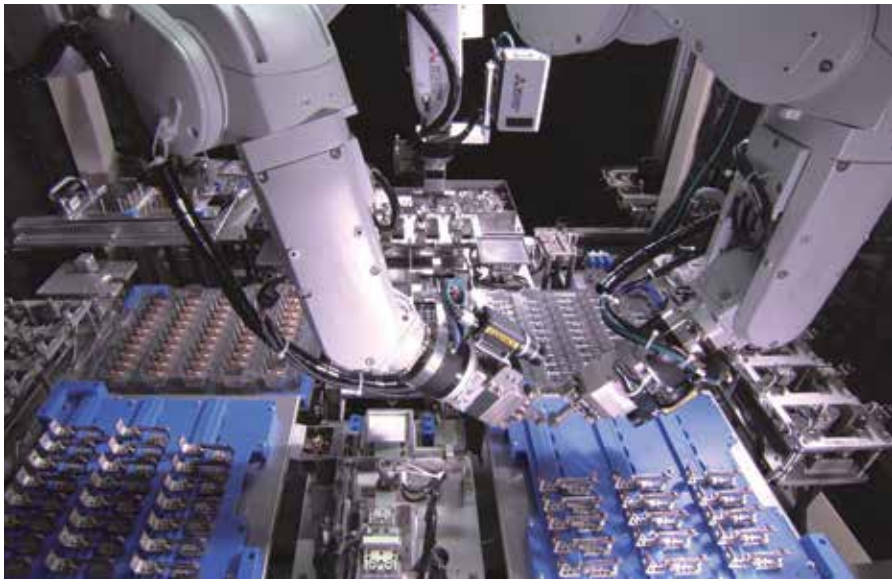


Photo courtesy of Mitsubishi Electric

Innovative Infeed Bus System Improves Quality, Lowers Costs

Dale Cyprien, Product Manager, IEC Motor Controls, Siemens

Henry Filters, a division of Barnes International, Inc., is a leading manufacturer of custom industrial liquid filtration systems and chip/swarf processing equipment that encompasses vacuum, gravity, pressure, and magnetic methods. Each system is engineered and manufactured in Bowling Green, Ohio, beginning with raw steel materials and ending with the completely finished products.

Based on size and complexity, custom-engineered systems can be shipped in one or multiple pieces to thousands of facilities worldwide, including to automobile manufacturers and their suppliers; machine tool manufacturers; and the aerospace, energy, and steel industries.

The company has differentiated itself from other filter suppliers by continuously bringing innovation to its portfolio of products.

"We are always looking for creative ways to lower overall costs. We pride ourselves in building state of the art controls systems while maintaining the same high-quality equipment for which we are known," summarized Steve Vollmar, Henry Filters operations manager.

Modularity Saves Time and Space

A good example of how Henry Filters kept its leading edge while delivering low total cost of ownership took place in 2012, when it supplied an endless belt gravity filter (EBGF) with a polishing media VAC filter (MV) system to the Chrysler plant in Saltillo, Mexico. The system was designed to filter 1,100 gallons per minute to the aluminum block machining process.

The EBGF system incorporates a continuously moving gravity belt loop through which all of the incoming fluid passes. A drag conveyor runs continuously below the belt loop to remove large contaminants from the dirty coolant. After passing through the gravity belt, the filtered coolant enters a larger settling tank where it has time for air to escape and particulate to settle. The coolant in this tank is then pumped through secondary filtration equipment before being returned to the block machining process. The MV filter helps remove very small particulate, helping extend coolant life.

According to Marc Gelinas, Henry Filters control engineering manager, when the company designed the controls system for the Saltillo filter system, it had to accommodate Chrysler's requirements: using a fuseless electrical control panel, maintaining a short-circuit current rating of 65KA at 480Y/277 VAC, and simplifying the overall panel design.

"Siemens came to us with a new infeed bus system that showed promise to not only dramatically cut material and labor costs but also save cabinet space and increase uptime," Mr. Gelinas said.

What first caught his attention about the three-phase, power distribution bus was its modularity.

Instead of using time-consuming wiring and tagging motor starters, components inside the control box snap together onto a bus with plug-in connectors. The bus is then easily connected to a standard 35mm DIN rail.

"We found it took 20 percent less time to wire the same components inside the machine-mounted panel, when compared to standard design methods," he said. "On a typical three-door panel for a job like the Chrysler installation, we estimated a savings of 30 hours associated with the wiring and tagging with our standard design."

The infeed system also saved valuable space inside the panel.

The infeed system has spare capability built into the panel for additional motors. When the company added another motor to the system in 2015, for example, there was no worry about power distribution blocks or other things that typically use up space in the initial design phase. No additional 480V supply wiring was needed—the addition was easily accomplished by snapping in the required base module, plugging in the 480V supply connector, and completing the control wiring. No drilling was required, so there was no worry about metal shavings falling on or into existing components.

Less Expense, More Uptime

Replacing fuses with snap-in breakers reduced material costs and saved up to 32 percent in inventory costs.

"For example, power wire material costs in a typical, traditional panel add up," Mr. Gelinas said. "The new system eliminates approximately 50 percent of the wire previously used to connect the fuses and other panel components."

Because the components are modular and quickly snapped onto the bus, time-consuming wiring and tagging has been eliminated in the field as well, not to mention the possibility of installing the wrong fuse.

There are other, not so obvious, advantages. Since the product is often shipped in one piece to its final destination, it may encounter a rough ride along the way (especially from Ohio to Saltillo). Because Henry Filters has greatly reduced the number of 480V wires landed on the distribution block, the chances of wires becoming loose are remote. In the past, technicians at the final location had to painstakingly tighten every lug. Now that the components are snapped into place, there are no more worries about loose lugs.

"Finally, and this is hard to quantify, there is something to be said for a clean-looking panel," Mr. Gelinas said. "The wires are gone and it certainly makes the panel more attractive for our customers."

Software Gets Smart for Manufacturing

At Phoenix Contact, project design software is used in all phases of smart manufacturing—design, planning, and manufacturing.

In the design phase, software allows users to easily design DIN rail mounted catalog items, basic markers, and accessories. The marking function allows users to design logos, barcodes, and industry symbols in addition to basic marking. A realistic representation of the finished product can be seen on a screen. The auto-configure option adds missed end-covers or end-brackets, ensuring a high-quality product.

Planning can be used to configure products such as those used in overcurrent and surge protection, power supply, signal conversion, and automation technology. Software automatically compiles a bill of materials, which then may be exported to the enterprise resource planning (ERP) system for efficient parts procurement and delivery to the manufacturing floor.

Photo courtesy of Phoenix Contact

Since the finished article may be displayed at each workstation, the finished product is touch-safe. Manufacturing can go paperless!

Joni Herbst, Senior Product Marketing Specialist, Industrial Products, and Ken Keim, ICT Product Specialist, Phoenix Contact

Strategically Approaching Workforce Development

Jonathan Stewart, Government Relations Manager, NEMA

Mr. Stewart leads NEMA's Workforce Development Strategic Initiative.

Good help is hard to find, and it will only get harder as NEMA members invent game-changing technologies and incorporate them into the industrial process.

Where will tomorrow's workers come from, and who will teach them the skills they need to excel? Even more fundamentally, will they even want to work in this industry? NEMA is looking for answers through its 2018 Workforce Development Strategic Initiative (SI). It has three distinct pathways.

INDUSTRY PROMOTION

The manufacturing industry in general—and NEMA's corner specifically—faces a branding crisis: tomorrow's workforce either doesn't know anything about us or what they do know (or think they know) they don't like. We need to change that. Electro-manufacturing is a vibrant, dynamic industry where students can prepare for careers that pay well. Starting in 2018, NEMA will develop digital tools that members can use to promote the industry. This component will be ready for National Manufacturing Day 2018.

APPRENTICESHIPS

Although the apprenticeship model is used globally to develop expertise in the skilled trades, it is less common in the United States. Developing one takes more resources than many NEMA members can spare. In 2018, NEMA will facilitate development of an apprenticeship program that can be locally tailored by member companies to recruit and train high school students.

CURRICULUM SHARING

NEMA members face a common challenge: recruiting qualified candidates for a skilled position when local colleges don't offer relevant coursework. The SI's curriculum-sharing component may offer a solution, based on the assumption that a community college somewhere has a great curriculum for that very position. NEMA will conduct a feasibility study of a curriculum-sharing framework. It will help identify an in-demand curriculum conducted by one community college and procure the right to share it with others. Such a hub-and-spoke model could be a critical step in addressing the recruiting challenge.

Learn more at www.nema.org/SI.

Robotic Revolution? Don't Revolt!

Chrissy L. Skudera, Director of Curriculum Development, Independent Electrical Contractors

The *Harvard Business Review* recently examined the changing landscape of retail, transportation, and manufacturing jobs due to an increase in automation. It reports that since 2000, robots have taken approximately 85 percent of the five million manufacturing jobs that have disappeared in the U.S.[1] That's a tremendous loss in jobs, but it's an even bigger opportunity to train employees for jobs that cannot be replaced by a shiny new robot.

When it comes to industrial automation, we can't have robots working on, essentially, other robots. We need trained electricians and engineers who can think, reason, and problem-solve when a part of the system fails.

The Independent Electrical Contractors' (IEC) Electrical and Systems Training Series (ESTS) offers experienced electricians refresher courses. For those new to the industry, IEC's four-year apprenticeship program educates students in the classroom and allows for on-the-job training. As an industry, it's crucial that

we educate workers—new and seasoned—to fill the roles that automation is presenting to us. The need for qualified workers is now.

"A career as an electrician is a gateway to more than 120 different trades, from educator to electrical engineer. With a shortage of trained and experienced electricians, it only makes sense to invest in those who are interested and excited to work in the field of industrial automation," said IEC CEO Spenser Villwock.

Electricity drives the world, and a career in the electrical industry is one that will never be taken by robots.

1 "As Machines Take Jobs, Companies Need to Get Creative about Making New Ones," *Harvard Business Review*. May 22, 2017

Creating Solutions to Shortages in Welding

It is no secret that there is a shortage of welders in the world today.

The American Welding Society estimates that by 2024, the industry will be 400,000 weld operators short of demand. Lack of educators and funding to teach the trade are key challenges that contribute to the shortage. While some high schools have withdrawn specialized classes and programs from their curricula, others have joined forces with technical colleges to enhance their class offerings.

As a manufacturer of welding equipment, Miller Electric Manufacturing Company has developed a two-pronged approach to help solve the welder shortage—collaboration and technical innovations.

Miller is collaborating with technical colleges and area businesses to upgrade curricula and enrich classroom experiences, developing talent to feed back to local industries. For instance, Miller and Fox Valley Technical College worked with Oshkosh Corporation to create the Advanced Manufacturing Technology Center. This state of the art facility with welding equipment and instructors is designed to build workforce skills. In addition to Fox Valley Tech, Miller Electric partners with many other programs by participating on advisory boards. These efforts are bridging welding education with technology while encouraging the growth of welding programs.

Bruce Albrecht, Vice President of Global Innovation & Technology, Miller Electric Manufacturing Co.

Building community connections through people is important, too. Michael Brandt, owner of Garage Bound in Chattanooga, Tennessee, works with students at a nearby high school to inspire students to express themselves through welding. When Mr. Brandt won an online competition, he donated his winnings to a local school to support its welding program.

Photo courtesy of Miller Electric

Innovative technologies also help beginners learn welding more easily and improve their skills. Augmented reality systems help students practice welding in a realistic and interpretive way. These products use sensors and simulation technology to allow students to weld and receive feedback on technique. In addition to training systems, there are specific products that deliver work instructions and weld quality analytics, providing real-time weld quality feedback and driving continuous improvement in both the classroom and on the factory floor.

With an emphasis on industry partnerships and technology, we are starting to transition the way welding and teaching welding are done.

See augmented and live arc demonstrations at www.nema.org/augmented-arc and www.nema.org/live-arc.

I Am the Electroindustry

Bruce Albrecht, Vice President of Global Innovation & Technology, Miller Electric Manufacturing Co.

When I drive a car over a bridge or look at a skyscraper, I think of the great technology and people that have created these welded structures. My work is important because the welding industry drives much of our economy and it is technically intriguing. I also see young people carve out well-paid careers adding value to society by welding. With 33 years in the industry, I have been leading businesses and engineering organizations to create solutions and make welding easier and more economical. I am grateful that I have these opportunities to make a difference.

Changing the Industry's Workforce

The University of California, Davis, is one school that encourages innovation with an LED design competition. This year the Department of Design focused on luminaires. Competition winner Peter Nasielski and his designs were honored at LIGHTFAIR. Photo courtesy of LEDVANCE

Jes Munk Hansen, CEO, LEDVANCE

Mr. Hansen is a member of the NEMA Board of Governors.

Our workforce deserves more. More growth and opportunities may result in more success for workers and their companies. Today's workforce needs to surpass traditional thinking and be more holistic and collaborative. It should be about more than reviewing organizational diagrams and ensuring an adequate manufacturing workforce. For our industry to evolve, workforce development needs to be networked to include the entire value channel of partners, universities, installers, maintenance professionals, and more.

NEMA's strategic initiative addresses this by reaching out to community college and high school students. LEDVANCE supports this initiative by collaborating with the Siemens SIschool that educates students about the technology and career opportunities in low-voltage electrical engineering.

As electrical manufacturers, however, we need to think beyond STEM for our industry to evolve. In addition to collaboration, we must attract and retain people who bring fresh perspectives and skill sets that can help manufacturers transition from a slow-paced traditional industry to a high-speed, high-tech one.

Why did this become necessary? Technological shifts, notably in light-emitting diode (LED) and intelligent lighting control, have disrupted traditional lighting. While technology is driving change, from a manufacturer's standpoint the real change is occurring in processes and the speed of doing business. That is where the real revolution is happening. We know LED technology and how to develop, source, and manufacture it. The greater challenge was to redevelop our company around that technology.

As an example, traditional lamp manufacturers manufactured and sold high volumes of highly standardized products. They introduced relatively few products each year, and products typically carried a very long product cycle. The product was in constant demand, supplying a steady volume of sales.

Today, lighting is a fast-moving technology field. Lamps integrate with luminaires, controls, and software to offer appliances that have more in common with smartphones than traditional lighting. This requires us to think of products as systems. The industry must regard these products as elements of an ecosystem in which quality may be defined not only by how products perform but also how they interact within the ecosystem. Today's products typically carry very short product cycles—one to two years and even shorter—necessitating careful management of the supply chain.

None of this is achievable without the right people. Traditionally, lighting was a very linear-thinking, hierarchical, insulated industry with a culture and processes oriented around its dynamics. As these dynamics have changed, so has our industry. We once focused on hiring lighting engineers with long resumes; now we look to bring in people adept in other fields, such as analytics, psychology, software, and communications—people who are experienced with collaboration and a faster pace of business. While engineering is still important, we need a more eclectic

overall mix, with about half of our staff consisting of specialists in numerous fields.

Attracting and retaining this talent can be challenging. To attract good people and bring out their best, we encourage a culture of open communication, cross-functional interaction, and risk taking.

Besides our own people, we actively collaborate with other organizations to inject even greater expertise into our products and processes. Even now, the lighting industry is very conservative—take form factors, for example. Universities encourage innovation and stretch the imagination. An example is the LED design competition at the University of California, Davis. This year the Department of Design focused on LED luminaires. LEDVANCE provided lighting products and technical support. We honored the winner at LIGHTFAIR and showcased his innovative design, which pushed the boundaries of what we might think possible from an MR16 lamp.

Technology may be changing the way we light buildings, but the most notable impacts are occurring in the industry itself. Today, electrical manufacturers must be fast and flexible to survive and thrive. We must focus on the fundamentals but also expand our thinking to be more holistic to succeed. Growth is enabled by having the right people in place, fresh perspectives, a more eclectic overall skill set, and a culture that supports speed, innovation, and collaboration.

Who Will Sustain DICOM and Other Standards?

Andrew Northup, Director, Global Affairs, MITA, and IEC Young Professional

The next time you find yourself in a standards meeting, look around. Whether you're at NEMA, MITA, ANSI, or the IEC, you'll see a room full of knowledgeable experts and seasoned leadership teams, working together to write and maintain standards as they have for years, or sometimes decades.

This is the standards workforce. It didn't create itself overnight. It took years for the individuals to gain enough technical knowledge to serve on that committee; years still to master the procedures, processes, and politics of their standards developing organizations; and several years on top of that to rise to a position of leadership.

If you add up all those years, you're looking at a group of professionals whose combined level of experience is staggering. Their combined seniority is irreplaceable. Many of these professionals are eligible for retirement. What if they all retired? Who would keep the standards world running if everyone who knew how to do it wasn't there anymore?

The International Electrotechnical Commission (IEC) understands how vital a competent, experienced workforce is to keeping the standards world not only running, but adapting to meet the needs of a changing world and dynamic technologies. It began the Young Professionals Programme (YPP) in 2010 to ensure that the next generation in the standards workforce is ready when the current leaders adjourn their last meeting before retirement.

After being selected as a YP in 2016, I got an inside look. The YPP doesn't just tell young professionals to go sit in a technical committee meeting, it makes sure that participants have a meaningful role to fill and are prepared to do so. It establishes a strong connection between the YPs and the members and leaders of the committees in their areas of interest.

The YPP strives to increase diversity in the standards workforce and create a more inclusive IEC by encouraging and supporting women and people from emerging nations as committee members and leaders. Not only will this allow the IEC to reflect the world we live in, but the new and diverse perspectives will add value and make the organization stronger.

The 2016 Young Professionals reflect a diverse future workforce in standards development. Photo courtesy of the IEC

Paul Molitor
President & CEO, IDEA

Data-Driven Inventory: Simply Error Free

Amid the excitement of automated industrial systems and innovative products, profitable legacy items may be neglected or forgotten. How can manufacturers be certain that these products remain visible—and profitable? The answer is to ensure that all trading partners stay informed about the status of all products in a manufacturer's inventory by maintaining and communicating accurate and up-to-date item statuses.

Correct item status information enables distributors to provide the best buying experience to end users with the right products in the right quantities at the right time. Manually tracking and communicating item statuses to all trading partners is cumbersome and leaves significant room for error.

When manufacturers maintain their item statuses electronically through IDEA's Industry Data Warehouse (IDW), the entire inventory management process becomes simpler and error free. Consider, for example, a distributor who purchases an item, believing it is in stock, when in reality a manufacturer needs to special order it. The distributor must accommodate this delay, which may have a negative effect with customers down the supply chain. If the distributor had an accurate view of the manufacturer's inventory and item statuses from the start, this costly adjustment could have been avoided.

There are several benefits to actively maintaining item statuses in the IDW:

- It provides manufacturers with one centralized location from which they can manage inventory information and publish it to multiple authorized distributors simultaneously.
- Manufacturers can reach 8,300+ distributor locations; in the past year, the number of distributor locations using the IDW for accurate product data doubled and it continues to grow.
- Distributors can properly identify and consolidate items in their own systems to better track inventory.
- Keeping manufacturers' systems synchronized with their distributors' systems enables manufacturers to ensure that all of their products receive equal visibility, whether new or legacy.

INCREASING VISIBILITY

The IDW offers manufacturers a number of codes to communicate about each item when distributors extract data.

Stock indicator codes help distributors understand inventory availability when they place an order. They include stock, quick-ship, non-stock (some large items may not be produced until an order is received), made-to-order, and configurable.

Item status codes help manufacturers to accurately manage and communicate product lifecycle changes so distributors can appropriately adjust their orders, quotes, shipments, and eCommerce sites. They include active, planned obsolescence, obsolete, and delete.

Manufacturers may not change their IDW data for legacy items as frequently as for newer items, so distributors can inadvertently overlook the older items or assume them to be inactive.

To prevent this, manufacturers should review the stock indicator and item status codes that are in place for their products when updating yearly pricing. At that time, a manufacturer can adjust any codes as needed, so they can be confident that their distributors know what is available and keep products moving off the shelves.

For more information, contact IDEA at info@idea4industry.com.

Preventing Injuries with TRRs

Each year, approximately 2,400 children are treated for shock and burns after sticking items into slots of electrical receptacles. To prevent these injuries, the 2017 edition of the *National Electrical Code*® (NEC) requires tamper resistant receptacles (TRRs) in new and renovated schools, hotels, waiting rooms, gyms, auditoriums, and other public facilities.

TRRs have proven to be so effective that the NEC now requires them to be installed in new homes.

Visit www.esfi.org to learn more about electrical safety.

Joseph Eaves
Director, Government Relations, NEMA

Building Congressional Relationships on Hill Days

Members of NEMA's Industrial Automation Control Products & Systems (1IS) and the Low Voltage Surge Protective Devices (5VS) sections took part in their first ever Hill Days last month. The meetings provided opportunities for companies to build relationships with their elected officials and to explain some of the issues facing their businesses.

Almost half of the 5VS members participated in a full day of meetings that targeted congressmen who have plants or offices in their districts. Participation among 1IS members was so high that participants split into two groups: one focused on the House and the other on the Senate.

Members of 1IS asked Congress to support and improve the manufacturing workforce by bridging skills gaps. While there are six million current job openings, nearly one in six Americans is either unemployed or underemployed. Members want Congress to find ways to improve educational and training infrastructure, especially at community colleges, so that American manufacturers may compete successfully in the global market.

The section also believes that the federal government should increase funding to improve wastewater, water processing, and other critical infrastructure. Outdated infrastructure not only wastes millions of dollars each year but also hinders our ability to grow as a nation.

Members of 1IS who visited Capitol Hill included (from the left) Mark Menzer of Danfoss, Neil Czarnecki of Reliance Controls, Ron Borowski of Eaton, Sheila Quinnies of Rockwell Automation, and Jim Creevy of ABB. Not pictured are Asaf Nagler and Peter Walter of ABB, Joe Rogers and Harrison Wadsworth of Siemens, and Richard Hoar of Nidec.

Members of 5VS outside the Rayburn House Office Building included (from the left) Ron Hotchkiss of Surge Suppression, Danny Abbate of NEMA, Steve Rood of Legrand/ Pass & Seymour, Stephen Liscinsky of Hubbell, Phillip Havens of Littelfuse, Bob Harmon of CITEL, Pankaj Lal of Schneider Electric, James Mongeau of Space Age Electronics, and Tom Colcombe of Eaton. Photos by Joseph Eaves

PROTECTING ELECTRICAL DEVICES

Members of 5VS used their Hill Day to explain surge protective device (SPD) technology to Congress for the first time.

SPDs protect electrical devices from voltage surges and spikes. In commercial buildings, they protect emergency lighting, computer systems, lighting, data centers, and electronic equipment. In industrial applications, they protect machinery, control systems, and vital telecommunications links. In the residential space, plug-in SPDs in the form of power strips protect home offices and entertainment equipment. A new trend in the residential space is hard-wired devices that protect the electrical system of the whole house.

Learn more at www.nemasurge.org.

Jack Lyons
Northeast Field Representative, NEMA

Tackling Regulation in Code Adoption

NEMA field representatives monitor and report on the progress and successful adoption of electrical, fire, and building codes throughout the country.

Because code adoption gets very technical, regulators responsible for code review and promulgation often reach out to stakeholders for help. NEMA provides jurisdictions with technical information through its Field Representative Program. The field reps support the language and the process by which the *National Electrical Code*® (NEC) and other codes are developed. They also provide the proper rationale for a code change.

Safety, efficiency, and reliability of electrical and fire systems are what drive code changes. We face challenges, however, with entities that politicize the adoption process. Some organizations, for example, present misinformation in the last phase of the adoption cycle, i.e., the legislative phase. The approval process in some states has shrouded the adoption process with issues that do not address the technical safety aspects of each change. We have seen products attacked as ineffective, or costly, contrary to sound technical data.

The field reps monitor activities throughout their regions and work closely with the NEMA Code Adoption Task Force to counter inaccurate statements and behind-the-scenes activities.

STATE ACTIVITY

Although New Hampshire, Maine, Rhode Island, and Vermont are on track for adopting the 2017 NEC prior to January 2, 2018, they are all in the rulemaking process. We will remain vigilant to be sure that last-minute changes do not occur. Maine and Rhode Island may have some delays as a result of administrative obstacles.

On a positive note, New York has a bill in the assembly to retain the three-year code adoption process, and Pennsylvania's House and Senate were scheduled to have voted to repair its regulatory process.

Learn more at www.nema.org/fieldreps and www.nema.org/stds/fieldreps/codealerts.

Lighting Standard Specifies Cable Requirements for PoE Installations

ANSI C137.3 *American National Standard for Lighting Systems—Minimum Requirements for Installation of Energy Efficient Power over Ethernet (PoE) Lighting Systems* addresses the use of PoE in applications that include, but are not limited to, commercial, residential, and industrial lighting.

According to Robert Hick, vice president of engineering, Leviton Lighting and Energy Solutions, "ANSI C137.3 provides the much-needed standardization of cable requirements for use by installers of PoE lighting systems. It ensures that PoE lighting will provide high energy efficiency in every building installation that is complying with this standard."

ANSI C137.3-2017 can be purchased for $46 in hard copy or as an electronic download on the NEMA website.

OTHER RECENTLY PUBLISHED STANDARDS

- ANSI C82.11-2017 *American National Standard for Lamp Ballasts—High Frequency Fluorescent Lamp Ballasts*, available for $420 in hard copy or as an electronic download on the NEMA website.
- NEMA LSD 58-2017 *Air Infiltration Ratings for Recessed Luminaires*, available as an electronic download at no cost on the NEMA website.
- NEMA SSL 1-2016 *Electronic Drivers for LED Devices, Arrays, or Systems*, available for $63 in hard copy or as an electronic download on the NEMA website.

Ann Brandstadter, Manager, Standards Publications and Marketing, NEMA

AUGUST-ONLY SPECIAL: 25% OFF LED GUIDE

During August, we're taking 25 percent off ANSI C78.52-2017 *American National Standard for Electric Lamps—LED (Light Emitting Diode) Direct Replacement Lamps—Method of Designation*. It includes a form for requesting direct replacement designations using lamp characteristic data. Buy it today for $263.

Craig Updyke
Director, Trade and Commercial Affairs, NEMA

Making the Case for Modernizing NAFTA

In formal written comments as well as oral testimony at a June public hearing, NEMA communicated its objectives and advice to the Trump administration regarding reopening and modernizing the North American Free Trade Agreement (NAFTA) among Canada, Mexico, and the United States. With NAFTA negotiations expected to begin in August, NEMA urged the administration to focus on supporting and enhancing the current North American commercial environment.

Mexico and Canada are far and away the largest and second-largest export markets, respectively, for the U.S. electroindustry. Mexico is the second-largest source of U.S. imports of NEMA-scope products, while Canada is the fifth largest.

"Working together, with advice from NEMA and other stakeholders, the three governments can modernize the agreement to advance rules-based open trade and remove unnecessary frictions and barriers to make North America a manufacturing location of choice for companies to do business," said Kyle Pitsor, NEMA vice president of government relations, at the June 28 hearing. Mr. Pitsor highlighted several key areas for action.

First, NAFTA should be updated to support cooperation and collaboration on regulatory and technical standards matters to reduce and eliminate trade conflicts and improve efficiencies while upholding safety, security, and other national objectives such as environmental protection. Second, the U.S. and its counterparts should use NAFTA to expand and deepen cooperation and collaboration on customs trade facilitation and enforcement. Third, rules used to determine whether a product qualifies for duty-free treatment under NAFTA should support member companies' supply chains. In addition, certification of compliance with such rules should be made less burdensome.

Other areas of NEMA interest include rules on digital trade, government procurement, and availability of testing and certification services.

Based on President Trump's criticism of the 23-year-old trade pact and his pledge to withdraw from or reopen it, NEMA staff spent the spring and early part of this summer consulting with member companies on their goals and objectives.

In April, NEMA conducted a webinar on NAFTA basics, key areas for negotiation, and what to expect from the administration. This was held in parallel with an online survey of all Association Voting Representatives to solicit member companies' ideas on how to improve NAFTA. The survey closed well before the administration formally notified Congress on May 18 of its intent to pursue negotiations with Ottawa and Mexico City. According to the NEMA-supported 2015 Trade Promotion Authority law, this notification set in motion a 90-day consultation period that concludes on August 16.

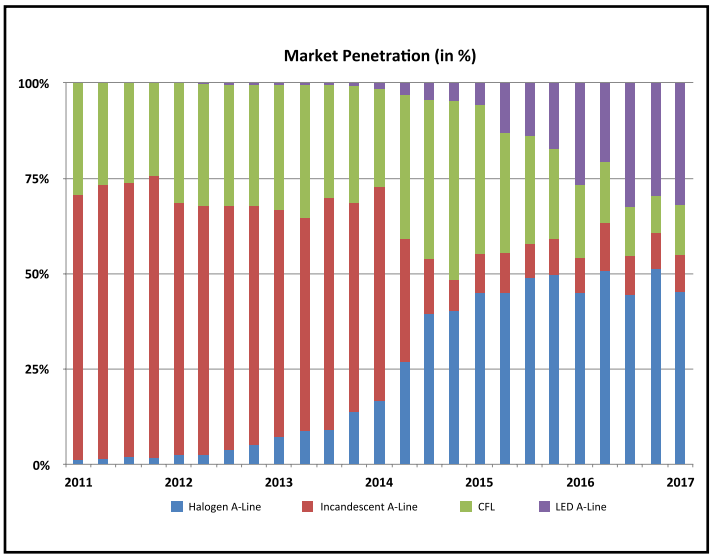
NEMA also initiated discussions with regional association counterparts on industry recommendations to the three governments.

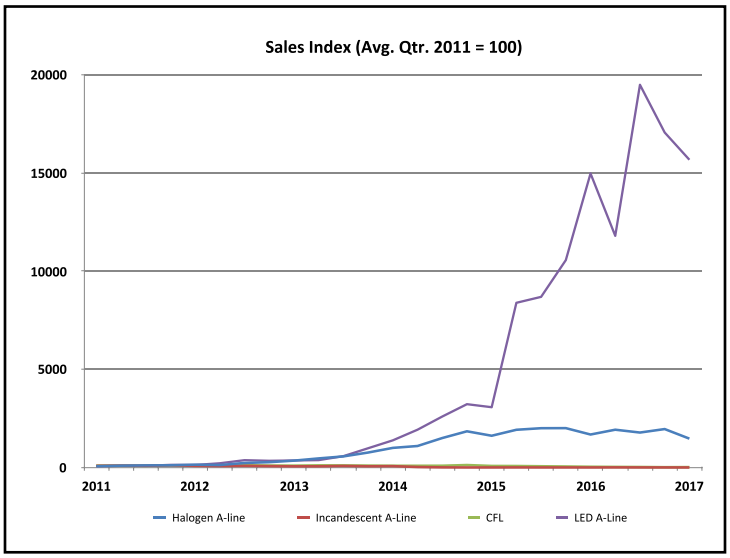
The autumn will be spent consulting with NEMA members and advising U.S. negotiators as they try to reach consensus with their counterparts from Ottawa and Mexico City. Mexican officials have openly stated their preference to conclude the negotiations by the end of the year.

Laurie Miller
Director of Statistical Operations, NEMA

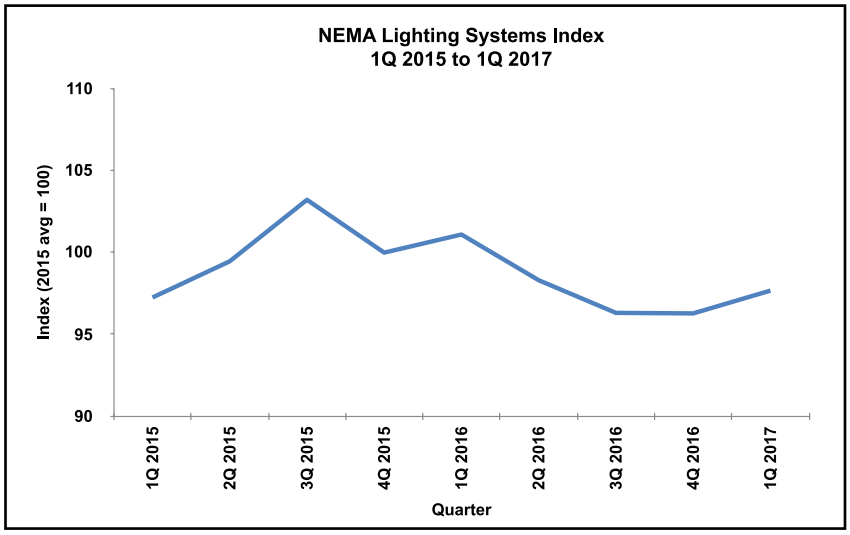
LED A-Line Lamp Shipments Up, Others Down

While light-emitting diode (LED) A-line lamp shipments decreased 8.1 percent in 1Q 2017 compared to 4Q 2016, they continued a year-over-year (y/y) climb, increasing 4.7 percent compared to 1Q 2016. Incandescent and halogen shipments posted a quarter-to-quarter decrease in 1Q 2017 compared to 4Q 2016 (14.9 and 24.8 percent, respectively). Compact fluorescent lamps (CFLs) posted a quarter-to-quarter increase of 18.5 percent. Incandescent, halogen, and CFL shipments all decreased in a y/y comparison of 1Q 2017 to 1Q 2016, decreasing 5.7 percent, 12.4 percent, and 39.9 percent, respectively. Halogen A-line lamps account for 45.1 percent of the consumer lamp market, followed by LED A-line lamps, which account for 32.0 percent. CFLs and incandescent split the remaining 1Q 2017 consumer lamp market, accounting for 13.3 and 9.6 percent, respectively. Incandescent A-line lamps largely consist of 15W and 25W lamps.





Expanded Lighting System Index Edges Higher



The first quarter of 2017 saw a 1.4 percent increase compared to 4Q 2016 but a 3.4 percent decline when compared to 1Q 2016. Emergency lighting, fixtures, and lighting controls posted quarter-over-quarter increases while the remaining components declined during the same period. The same components also posted year-over-year increases, but were offset by the decline in ballasts (HID and florescent), LED drivers, large lamps, and LED replacement lamp shipments.

Other Lighting Indexes

www.nema.org/hid-lamp-indexes
www.nema.org/fluorescent-lamp-indexes

Steve Wilcox
Director, Market Research, NEMA

Strength in End Markets Offsets Lack of Policy Progress

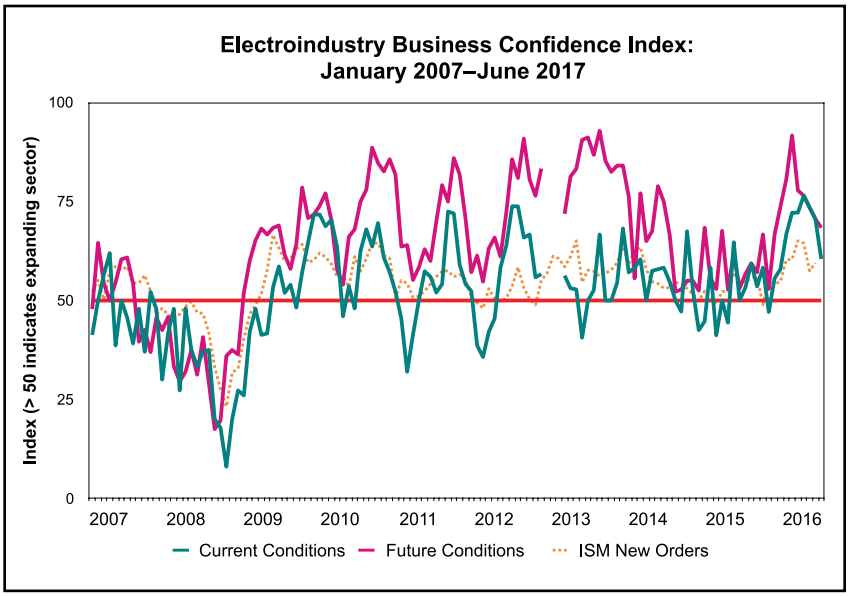
A 10-point slide from 70.6 in May to 60.5 in June brings the NEMA Electroindustry Business Conditions Index (EBCI) to its lowest level since November 2016. Nevertheless, because it remains above 50, the index value is still in the expansionary range. The share of those reporting better conditions dropped by 15 percentage points from May to June, but most of that sentiment shifted to "unchanged" as that component jumped 11 points from 47 percent in May to 58 percent in June. The proportion of panel members noting worse conditions edged up to 11 percent from 6 percent in May.

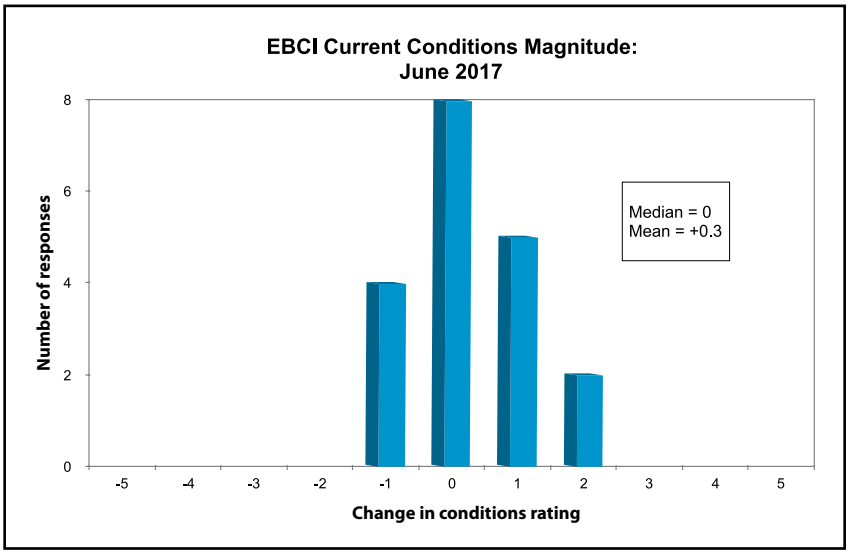
The intensity of change in electroindustry business conditions swung to a much less buoyant mark as both the median and mean scores declined. The median, which had settled in at 1.0 since January, edged down to 0 in June. Likewise, the mean value, which had not dropped below 0.6 this year, slid to 0.3. Panelists are asked to report intensity of change on a scale ranging from –5 (deteriorated significantly) through 0 (unchanged) to +5 (improved significantly).

Although the future conditions index also declined, easing to 68.4 in June from 70.6 in May, most respondents remained optimistic about conditions facing the industry in six months. In both May and June, 53 percent of our panel members reported expectations of better conditions six months out, while 16 percent foresaw worse conditions in the latest survey. A sizable proportion of respondents, 32 percent, expected to see future conditions unchanged.

Visit www.nema.org/ebci for the complete June 2017 report.

	Current Conditions (Compared to Previous Month)	**Conditions Six Months from Now** (Compared to Current Conditions)
EBCI	60.5 ▼	68.4 ▼
% Better	32% ▼	53% ▬
% Worse	11% ▲	16% ▲
% Unchanged	58% ▲	32% ▼





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