

electroindustry

www.nema.org | October 2018 | Vol. 23 No. 10

Setting a Course for Electrical Safety

- 5 | Get Out the Vote
- 8 | Standards, Codes, and Compliance
- 12 | Advocating for Adoption
- 17 | NRTL Showcase



NEMA



intertek

Total Quality. Assured.



Intertek

MORE THAN A MARK

From supply chains to cyber security and more, we provide total quality assurance services that go far beyond certification.



Global
Certification



Cyber
Security



Environmental



Retail &
Associations



Supply
Chains



Product
Performance



Materials &
Chemicals



Energy
Efficiency



icenter@intertek.com



1-800-WORLD-LAB (967-5352)



intertek.com

CONTENTS



5

NEMAPAC Chair Andrew Quinn says Get Out the Vote!



5

Lisa Spellman appointed to USNC Committee.



19

Zijun Tong has a passion for making a difference.

electroindustry

Publisher | Tracy Cullen
Editor in Chief | Pat Walsh
Contributing Editors | Ann Brandstadter,
Mariela Echeverria, Andrea Goodwin,
William E. Green III
Art Director | Jennifer Tillmann
National Sales Manager | Tilman Gerald
The Townsend Group
202.367.2497
tgerald@townsend-group.com

electroindustry (ei) magazine (ISSN 1066-2464) is published monthly by the National Electrical Manufacturers Association (NEMA), 1300 N. 17th Street, Suite 900, Rosslyn, VA 22209; 703.841.3200. Periodicals postage paid at Rosslyn, Virginia, and additional mailing offices. POSTMASTER: Send address changes to NEMA, 1300 N. 17th Street, Suite 900, Rosslyn, VA 22209. The opinions or views expressed in *ei* do not necessarily reflect the positions of NEMA or any of its subdivisions. The editorial staff reserves the right to edit all submissions but will not alter the author's viewpoint. Every attempt is made to ensure that information is current and accurate.

Subscribe to *ei* at www.nema.org/subscribe2ei.
Contact us at ei@nema.org.

Follow NEMA:    

We thank our advertisers:



ansi.org



ENCORE WIRE encorewire.com



intertek.com



qps.ca



www.tuv.com

8

Setting a Course for Safety

Vince Baclawski, Senior Technical Director, Codes and Standards, NEMA

Don Iverson, Midwest Field Representative, NEMA

11

Overcurrent Protection Leads to Compliance

Nick Offerman, Field Application Engineering Manager, Eaton's Bussmann Division

13

e-Business Standards Enable Innovation

Marjorie Romeyn-Sanabria, Communication Specialist, IDEA

15

Making Safety Smart in Smart Buildings

Rodger Reiswig, Vice President, Industry Relations, Johnson Controls Global Fire Protection Products

16

Roadmapping Seismic Conformance

Philip Caldwell, Edison Expert, External Affairs, Schneider Electric

3

Comments from the Chairman

4

Views

5

Electric News

19

Advocacy

19

Spotlight

20

Codes & Standards

21

Business Analytics

STOCKART

Cover, 8-13: istockphoto.com/jokerpro

7: istockphoto.com/industryview

15: istockphoto.com/AndreySuslov

16: istockphoto.com/DNY59

20: istockphoto.com/sydeen

Are you designing intelligent transport systems?

Get the latest standards for controller area networks (CAN), Intelligent Transport Systems (ITS), and Traffic and Travel Information (TTI)

Visit webstore.ansi.org/transportation





officers

Chairman

David G. Nord

Chairman, President & CEO
Hubbell Incorporated

Vice Chairman

Mark Gliebe

Chairman & CEO
Regal Beloit Corporation

Treasurer

Theodore D. Crandall

Senior Vice President
Control Products and Solutions
Rockwell Automation

Immediate Past Chairman

Michael Pessina

Co-CEO & President
Lutron Electronics Co., Inc.

President & CEO

Kevin J. Cosgriff

Secretary

Clark R. Silcox

Change is occurring at an unprecedented pace, and it's only getting faster. According to Gartner, by 2020, five of the top seven digital giants will willfully "self-disrupt" to create their next market leadership opportunity.¹ To keep up in a digitized world, NEMA must adopt new productivity strategies for its intellectual properties and optimize our processes for developing them.

We must get Standards done *right*, but we must also get them done *quickly*. On average, it takes us nearly two and a half years to develop a new one—an inadequate timeframe in the current environment. Although Standards are likely to be relevant for years or even decades, we need to think differently about how we can bring them to market sooner. This may mean iterative generations, *beta* versions that are released to market for early adopters, or identifying alternative ways to provide technical guidance to the market.

Fundamental to the process is achieving consensus, and that challenge will not go away. Nor will face-to-face meetings. The tools available in the digital era, however, should help us get to consensus faster and capture ideas when the spark of creativity occurs, not just when the next meeting is scheduled. Online platforms, document sharing software, and webcasts, for example, allow work across distance and time zones, enabling more people with broader areas of expertise to contribute real-time with less disruption to our volunteers' day jobs and our Member companies' valuable resources.

NEMA needs to be the hub for innovation—in intellectual property as well as in technology—to remain relevant. Getting there will take time and effort. To that end, the NEMA Industry Future Forum at the Annual Meeting in San Antonio next month will explore how our association can best meet the challenges of this digitized century. I encourage Member C-suite executives to reserve a seat at the table. In exploring the future of NEMA as an association focused on Standards, Advocacy, and Business Intelligence, forward-looking discussions will focus on where the electroindustry is heading and how NEMA can evolve to help its Members succeed.

I extend my thanks on behalf of the NEMA Board of Governors to the countless company professionals who conceive, write, and maintain our industry's shared intellectual property. I am confident that they will bring the same vision and focus to our fast-changing world as we collectively take the next leaps of technology and its complementary Standards development. 🌐

David G. Nord

Chairman, NEMA Board of Governors

¹ Top Strategic Predictions for 2018 and Beyond, <https://www.gartner.com/doc/3803530?refval=&pcp=mpe>



Securing the Future of Electrical Safety Through Codes and Standards



We live in an exciting time in which innovations appear almost daily. Over the last decade, we've seen many changes with regard to renewable energy, light-emitting diode (LED) and other lighting, Power over Ethernet, battery technology, and direct current power.

Not only is it important that installation and product Standards stay current with new technology and practices, but it is also critical that the built environment is safe from fire and shock hazards. Similar to what is happening in the information technology industry, the electroindustry is experiencing rapid changes in systems and products—something new today is already outdated tomorrow.

As electrical systems and products change, it is paramount that we stay ahead of that curve. What is even more important is the early adoption of Standards without deletions or amendments.

One of the ever-evolving topics in the *National Electrical Code*[®] (NEC) is photovoltaic systems (PV). Ensuring safety with solar has been a relatively new endeavor. We first began to see solar arrays producing more than five megawatts (MW) in 2007. Arrays exceeding 100 MW are in their infancy, having all been built within the last six years, according to the Solar Energy Industries Association.

While some may have thought of solar as just a fad, this trend toward harnessing and using sustainable energy isn't going away. The demand for PV installations will only increase across the United States and around the world. Places like Atlanta, Denver, Hawaii, and California are setting goals for 100 percent renewable energy.

Codes are now focused on energy storage systems (ESS) that are used with PV and other renewable technologies, according to Joseph Wages Jr., IAEI technical advisor of education, codes, and Standards. Laure-Jeanne Davignon, director of workforce development for Interstate Renewable Energy Council, agrees. She sees ESS training as an emerging field. Furthermore, a January 2016 article from *NFPA Journal*¹ reported on the many safety questions, including risks to first responders and the public from exposure to toxic fumes, electricity, and other hazards associated with ESS if a fire or other incident were to occur.

The key to staying on top of the technological changes we're seeing is to ensure that the whole electroindustry is involved in creating Standards and influencing safety, not just one particular group. It takes manufacturers, installers, designers, standards developing bodies, certification agencies, and—last but not least—the enforcer community to ensure a safe built environment. ☺

¹ <https://www.nfpa.org/News-and-Research/Publications/NFPA-Journal/2016/January-February-2016/Features/ESS>

THE U.S. CELEBRATION OF



THURSDAY, OCTOBER 18, 2018

From far-reaching progress in artificial intelligence, the Internet of Things (IoT), and virtual and augmented reality to specific advancements in areas such as smart health, e-commerce and digital transactions, 3D printing, and autonomous vehicles, voluntary Standards and conformity assessment enable innovators across nearly every industry to build on established technologies and deploy cutting-edge advancements with safety, efficiency, and reliability.

Learn more about World Standards Day at https://www.ansi.org/meetings_events/wsw18/wsd?menuid=8. ☺

Employers: Encourage Staff to Get Out and Vote!

With federal and state elections taking place in November, this is a good time for company executives to discuss with their employees the impact policy issues have on operations, jobs, and growth, as well as to encourage active participation in elections. These efforts, commonly known as Get Out the Vote (GOTV) efforts, do not endorse any candidate and are designed to support the exercise of a most important constitutional right—the right to vote.

According to a report by Business-Industry Political Action Committee (BIPAC) in 2014, employers are a more credible source of information for an employee on political and public policy issues than both parties combined.¹

NEMA Members and their employees are encouraged to become directly involved in policy and political processes through GOTV advocacy efforts. Online tools include information on how to:

- learn about the study on business leadership impact on voter turnout;
- obtain voter registration information;
- discover helpful ideas aimed at building a more politically informed workforce;
- implement a Get-Out-the-Vote program at your company;
- find your legislator and learn about their voting records on key industry issues;
- learn about the “dos and don’ts” regarding federal election law;
- locate a state-by-state election calendar;
- obtain information pertaining to Government 101—ranging from how a bill becomes a law to helpful links to the House of Representatives and the Senate; and
- locate important links to build voter education.

For more information about NEMA’s political and election activities, visit www.nema.org/vote. 



Andrew Quinn, NEMAPAC Chairman

¹ www.bipac.net/2014/BIPAC_Market_Research_Report_Jan2015.pdf

ELECTRIC NEWS

Lisa Spellman Appointed to USNC IEC Finance Committee



Lisa Spellman of the Medical Imaging & Technology Alliance (MITA), a Division of NEMA, was appointed to the Finance Committee of the United States National Committee of the International Electrotechnical Commission (USNC/IEC).

Ms. Spellman is the general-secretary for Digital Imaging and Communications in Medicine (DICOM), providing strategic leadership and management of operational affairs for DICOM stakeholders around the world.

In this competitive appointment, Ms. Spellman will oversee and provide input on the budget of the USNC/IEC, which brings issues from the global electrotechnical industry into the U.S. for review, consideration, and thoughtful response. The appointment further elevates MITA’s position as a crucial player in the international standards-setting and advocacy communities for electrotechnologies, including medical imaging technologies.

MITA is the leading organization and collective voice of medical imaging equipment manufacturers, innovators, and developers. 

NAFTA Modernization Update

Craig Updyke, Director,
Trade and Commercial
Affairs, NEMA

On August 31, President Trump notified Congress of his intention to enter into a new trade agreement with Mexico and, if possible, Canada, to replace the North American Free Trade Agreement (NAFTA). While negotiations with Mexico were largely concluded on that day with an agreement in principle, talks between the U.S. and Canada continued into September.

NEMA urged the negotiations to result in agreement among all three countries on a state-of-the-art platform for North American

electroindustry manufacturing and trade. Under U.S. law, the text of the new trade agreement would become public on October 1 and could be signed by President Trump and his counterparts on November 30, the final day of Mexican President Enrique Peña Nieto's term of office. The U.S. Congress would likely not act on any legislation to implement the new agreement until early 2019.

NEMA Members may learn more and take action by visiting the NEMA NAFTA campaign under Trade at <https://nema.quorum.us>. ☎

Tariff Initiatives Update

On September 6, NEMA filed formal written comments with the Office of the United States Trade Representative (USTR) on its proposal to place additional import tariffs of 10 or 25 percent on a list of more than 6,000 products made in China. The list included more than 70 product types of concern for NEMA Members, including finished goods as well as inputs and components that support manufacturing and assembly operations located in the U.S., accounting for imports in 2017 valued at approximately \$22 billion.

Writ large, if 10 or 25 percent tariffs were to be implemented as proposed, they could represent an additional tax increase on U.S. electroindustry companies and their industrial, commercial, and residential customers of approximately \$2.2 billion to \$5.4 billion. These tariffs would be in addition to the \$2 billion in U.S. tariffs implemented on Chinese-made products imported under approximately 100 8-digit Harmonized System codes on July 6 as well

as \$500 million in tariffs begun on 31 Harmonized System codes on August 23.

Also on September 6, the Commerce Department released a pre-publication copy of a new interim final rule governing the exclusion process for imported steel and aluminum products that face tariffs or quantitative restrictions based on U.S. national security concerns.

Under the new rule, which is open for public comment, petitioners who face objections from domestic steel or aluminum companies will have the opportunity to publicly rebut those objections. The objectors will also have a chance to respond to the petitioners' rebuttal. Commerce also clarified several criteria it uses in evaluating petitions and objections, including domestic availability and product quality.

For more information, contact Craig Updyke at craig.updyke@nema.org. ☎

IoT Webinar

U.S. electrical manufacturers are involved in the electrification and digitization of America's infrastructure, including roads, rail, air, and waterways. The coming wave of the connected, autonomous, and electrified vehicle landscape requires collaboration within the industry and among private and public entities to ensure the safety and expediency of the transition.

Join NEMA and Applied Information on October 12 for the next IoTNOW webinar, Transportation Transformation: What's Driving the Future?



Registration is free for all NEMA Members. The nonmember fee is \$49 per webinar; discounts are available for bulk registration. For more information, visit www.iotnowwebinars.org. ☎

NEMA Shines at SES Annual Meeting

Zijun Tong (left), Lisa Spellman, and Muhammad Ali were among those who made NEMA's presence known at the SES annual meeting. Mr. Ali and Ms. Spellman, program managers, were course instructors on standardization and conformity assessment; Suzanne Alfano, industry director, moderated a session on case studies that address the opportunities and challenges; and Jonathan Stewart, industry director, moderated the workshop on workforce development with speakers that included NEMA Member Rockwell Automation. Mr. Ali, SES membership council director, also presented the 2018 SES Student Scholarship Award sponsored by NEMA and UL.



Andrei Moldoveanu, who was elected to the SES Board of Directors, also was confirmed as a new SES technical director for overseeing Standards and certification. Program managers Michael Erbesfeld, Carolyn Hull, and Zijun Tong received points toward SES Standards Professional Certification. NEMA Member companies were represented by Ed Eckert, Itron, Inc.; Marcelo Valdes, ABB Inc.; and Svetlana Ulemek, BURNDY LLC. 🇺🇸

Workforce Development Seminar

November 14, 2018 | 10:30 a.m.-4:30 p.m.

www.nema.org/workforce-development-seminar



BOOK-A-SPEAKER



Kirk Anderson, NEMA Industry Director for Industrial Systems, will address the regulatory status of electric motor systems in the United States at the Motor Summit International November 14-15 in Zurich.



Steve Griffith, PMP, principal staff liaison for NEMA's Internet of Things (IoT) and cybersecurity activities, will speak October 5 at the 6th Annual Internet of Things Global Summit in Washington, D.C., as a panelist on IoT Security and Resilience in the Age of Digital Transformation.



Senior Program Manager Brian Marchionini will speak on trends and drivers in grid modernization at Viakable's Annual Technological Forum in Monterrey, Mexico, on October 5.

Do you need an electroindustry subject matter expert to speak at your next event? Contact book-a-speaker@nema.org or visit www.nema.org/book-a-speaker. 🇺🇸

Setting a Course for Safety with Standards, Compliance, and Code Adoption

Vince Baclawski,
Senior Technical
Director, Codes and
Standards, NEMA

Don Iverson,
Midwest Field
Representative,
NEMA

Standards and code adoption are the underlying strength of a robust and cohesive electrical safety system. The adoption of model codes by states and other jurisdictions begins with the interrelationship of four distinct entities that craft the cornerstone of this system. Standards, codes, certification, and code enforcement together ensure safe products and safe installations.

Each entity represents a consensus within each segment of the electrical community, i.e., users, contractors, designers and installers, inspectors, testing laboratories, manufacturers, electrical workers, and insurers.

Comprehensive Model

An effective electrical safety system has interconnected components that affect the implementation, as illustrated in Figure 1.

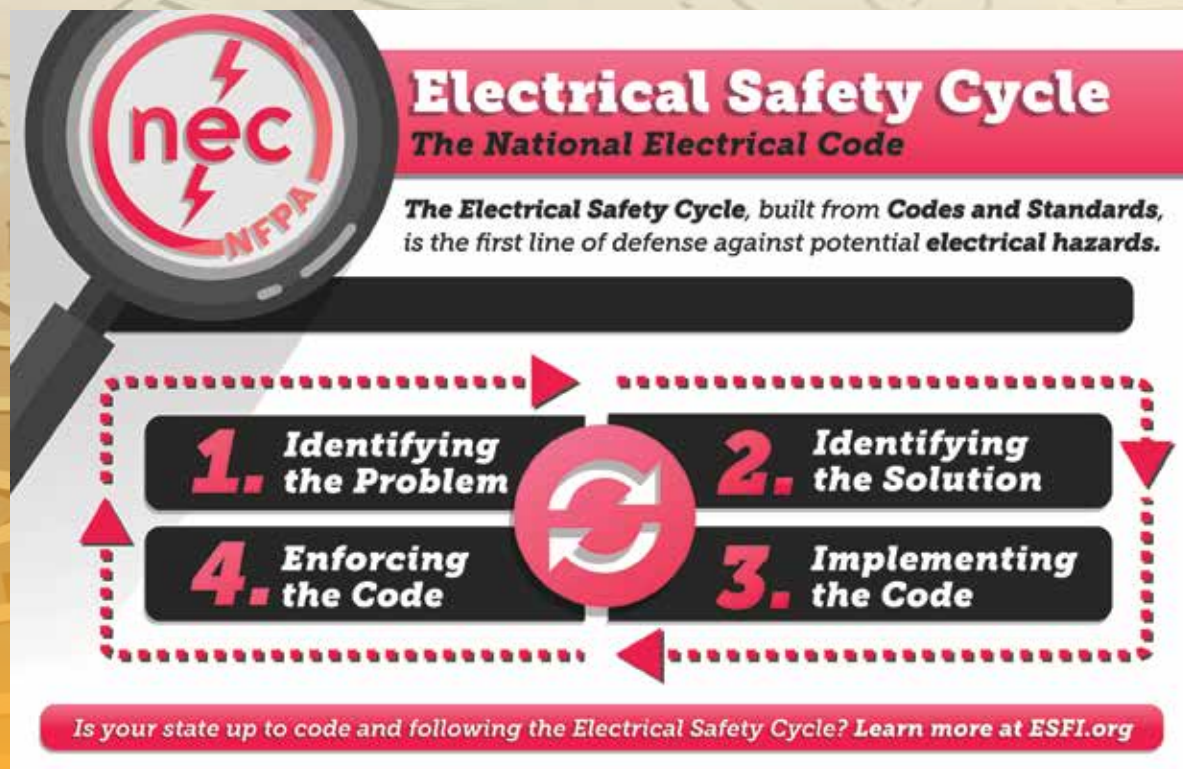
Figure 1. The Electrical Safety Cycle

PRODUCT STANDARDS

Standards establish the minimum level of safety and associated reliability for a product. They must be directly compatible with the electrical installation code that covers electrical products used in the electrical system.

Standards need to be developed with wide input and review from various electrical community segments. The best way to accomplish this objective is to develop them through a consensus-based, nationally recognized process that provides for wide participation of the electrical community. This broad review ensures that each product Standard reflects the level of safety and the necessary infrastructure compatibility within a defined scope.

Despite their appearance and traditional use, Standards also reflect social objectives, that is, what a society articulates as acceptable levels of risk.



Infographic by Daniel Majano, Program and Digital Marketing Manager, ESFI

An example can be found in warnings and cautions used to prevent foreseeable accidents. In societies where tort law reaches into this process, these considerations are paramount. Standards must be written in a manner that allows for consistent interpretation, enforcement, and certification, if needed.

CERTIFICATION

Manufacturers often use independent testing, inspection, and certification (TIC) organizations to certify that their products perform as claimed. In the United States, TICs are often referred to as Nationally Recognized Testing Laboratories (NRTLs). NRTL certification is often a requirement to having products included within state or local installation codes.

INSTALLATION CODES

The installation code is the key driver for the system. It provides the fundamental safety principles and installation rules that deliver a safe electrical system. Compatibility with Standards and enforceable prescriptive language ensures that products support safety objectives. Enforceable rules must be measurable and are often necessarily prescriptive.

Continued on page 10

Industrywide Impacts

- **ANSI/NEMA SG-IPRM 1 Smart Grid Interoperability Process Reference Manual** defines a process to procure, test, and assert interoperability between disparate vendors of smart grid products.
- **ANSI/NEMA WD 6 Wiring Devices—Dimensional Specifications** covers dimensions for wall plates, including configuration tables.
- **NEMA 250 Enclosures for Electrical Equipment** covers enclosures for electrical equipment installed and used in hazardous and non-hazardous environmental conditions.
- **NEMA ICS 10, Part 3: Safety Bulletin** identifies safety considerations for residential use of transfer switches.
- **NTCIP Standards** define the functional control and communications profiles for electronic traffic control equipment.

Forward-Looking Lighting Standards

The lighting industry is in the midst of a revolution. The entry of cost-effective light-emitting diode (LED) technology into the marketplace ushered in an era of affordable, versatile, and adaptable lighting. NEMA Standards provide guidance and test methods to improve LED function and performance.

For example, NEMA SSL 7A and NEMA 77 address the interaction between LEDs and lighting controls: the former to reduce the occurrence of visual lighting artifacts (broadly referred to as “flicker”) and the latter to better measure flicker and stroboscopic effects. The ability to measure and evaluate the interaction of LED sources and their controls enables lighting designers and consumers to effectively pair products.

One significant challenge with LEDs is satisfactory performance during dimming. While many LED lamp manufacturers claim backward compatibility with dimmers designed for incandescent lamps, they are challenged to deliver because of the thousands of dimmer designs that exist. Earlier this year, NEMA launched a marking program to identify proper pairs. See www.nema.org/led-dimming.

NEMA and its ANSI lighting committees also manage test procedures for fluorescent ballasts at test points other than full output and are also developing test procedures to measure the energy efficiency of solid state lighting (SSL) drivers, which power the latest LED technology for room and area lighting. While these drivers are energy efficient by nature, it is not always fair to assume that all SSL drivers are equally efficient. Thus it is useful to be able to compare them and hold underperforming products accountable.

At the same time, the emergence of highly adaptive lighting products means that sensors and controls that were not possible with legacy technologies are more feasible than ever. It is worth noting that the “solid state” in SSL refers to electronics, which are highly flexible in terms of control capability and measurement, especially when compared to analog discharge lighting technologies. NEMA Standards for controls interaction and systems interaction, such as those being written by the NEMA ANSI Committee C137, are forward looking in their applications as effective lighting systems.

The effectiveness of NEMA SSL 7A and NEMA 77 is evidenced in their use as references in the ENERGY STAR® lamps program specification and in California lighting regulations (i.e., Title 24 and Title 20).

The use of and reference to NEMA Standards by specifiers and regulators ensures that well-written, well-understood Standards drive innovation and installation of high-quality products and lighting systems. 

Alex Boesenberg, Senior Manager, Government Relations, NEMA

Continued from page 9

INSPECTION AND ENFORCEMENT

Most often overlooked in an effective safety system is the need for an efficient and effective system of enforcement for compliance. Qualified inspectors provide the needed controls for such a system. Their strength can determine the impact on code adoption.

For example, a state legislature may be influenced by a builders' association to forgo a provision in a building code. A member of NEMA's Government Relations team may study the lay of the land and subsequently hire a consultant to lobby the legislature to uphold the provision.

There is a growing concern associated with the "quality assurance"-based inspection approach in which systems rely on review of the plans and limited auditing instead of thorough and timely on-site inspections throughout the course of the construction.

The majority of the electrical community welcomes a system of inspections that provides needed checks and balances. By contrast, taking a quality assurance approach only serves to keep the revenue from permit fees flowing without adding any value.

Safe Products, Safe Installations

Each component (Standard, installation code, certification, and enforcement) is interconnected and must be coordinated to achieve the expected level of electrical safety. When products and systems are built to comply with current safety Standards, the final step is proper installation confirmed by inspection by authorities having jurisdiction.

Electrical safety is not an accident. History has proven that systems containing all these elements work very well. Ⓔ

Adding Low Voltage SPDs to the NEC®

The increased use of electrical equipment in residential, commercial, and industrial settings necessitates protection from external surge sources (like lightning) and internal surges generated by the operation of contactors, relays, breakers, switching of capacitor banks, discharge of inductive devices, or starting and stopping of any electrical load. A surge protective device (SPD) lessens power surges by diverting or limiting surge current and is capable of repeating these functions as specified.

Currently, the *National Electrical Code*® (NEC) requires SPDs on equipment that protects electronics, including:

- emergency systems—a listed SPD shall be installed in or on all emergency switchboards and panelboards;
- elevators, escalators, moving walks, and chairlifts;
- modular data centers;
- wind electric systems;
- industrial machinery; and
- fire pump controllers.

SPDs are a cost-effective solution to prevent downtime, improve system and data reliability, and eliminate equipment damage caused by transients and surges for both power and signal lines. They are suitable for any facility or load (1,000 volts and below).

Proposals are being developed within NEMA's Low Voltage Surge Protective Devices Section to add requirements to the NEC to address the recognized need for surge protection in residential dwellings to protect sensitive electronics and systems found in most modern appliances, safety devices (e.g., arc-fault and ground-fault circuit interrupters), and smoke alarms.

NEMA's Surge Protection Institute offers guidance materials and practical resources designed for engineers, contractors, and inspectors at www.nemasurge.org. Ⓔ

**Danny Abbate, Industry Director,
Building Infrastructure Division, NEMA**

Overcurrent Protection Leads to Compliance

Fuseology is defined as the study of a fuse's operating principles and its unique role in circuit protection. These principles include ratings, operating characteristics, and constructions that enable the fuse to act as a highly effective overcurrent protective device (OCPD).

Reliable OCPDs help prevent and minimize costly equipment damage while enhancing electrical safety and avoiding downtime. Many industry professionals rarely encounter the basics of reliable overcurrent protection during their courses of study, but it's important to be aware of the three key principles for applying OCPDs.

These principles, referred to as Friemel's Laws of Overcurrent Protection, provide a solid foundation for industry professionals to leverage regardless of *National Electrical Code*® (NEC) changes. While these principles are not all-inclusive of the considerations in applying OCPDs, an understanding of these three key concepts will lead to a safer, more reliable, and code-compliant electrical system:

- **Friemel's first law—interrupting rating:** OCPDs shall be applied with an interrupting rating equal to or greater than the maximum available fault current.
- **Friemel's second law—component protection:** OCPDs shall be selected and installed to clear a fault without extensive damage to electrical equipment and components.
- **Friemel's third law—selective coordination:** A properly engineered and installed electrical system will restrict outages to only the nearest upstream OCPD for the full range of overcurrents and associated opening times, leaving the remainder of the system undisturbed and preserving service continuity.

These laws encompass the unique operating principles of modern-day current-limiting fuses, including high interrupting ratings to safely open very high fault currents; current limitation to "limit" fault currents to low values for optimum component and equipment protection; and simple selective coordination for the full range of overcurrents to prevent blackouts caused by upstream OCPDs cascading open when applied with the correct ampere rating ratios. Ⓢ

Nick Offerman, Field Application Engineering Manager,
Eaton's Bussmann Division

DICOM Streamlines Imaging Communication Worldwide

Digital Imaging and Communications in Medicine (DICOM®) standardizes the communication of medical imaging information. First published in the 1980s, it is maintained by a collaborative committee of industry and medical professional societies. DICOM maintains active liaisons with several standards developing organizations.

Even though DICOM has been deployed globally, it is a consensus Standard that is largely voluntarily adopted based on its utility and not as a result of a legal or regulatory mandate. In the United States, DICOM is recognized by the Food and Drug Administration (FDA) as a consensus Standard. It is similarly recognized in most European Union nations and Japan.

Adoption of voluntary consensus Standards is a smart move for vendors and end users. Vendors can decrease R&D time, allowing resources to be directed toward innovations and market completion features. The adoption of medical device products can streamline premarket review, provide clearer regulatory expectations, and facilitate market entry.

According to the FDA, "Consensus standards provide a consensus approach to certain aspects of the evaluation of device safety and effectiveness, such as testing methods, pass/fail performance criteria, and processes to address areas, such as risk management and usability. The use of consensus standards can also promote international harmonization."

For clinical end users, requesting a voluntary consensus Standard such as DICOM in RFPs helps to promote interoperability between clinical systems.

To learn more, visit www.dicomstandard.org. Ⓢ

Lisa Spellman, AStd, DICOM General Secretary, MITA

Affecting Change Through Education

The NEMA field representatives' contributions to state code adoption involves more than advocacy and support. Education plays a significant role before, during, and after the code adoption cycle.

This education can take on many forms and includes virtually all stakeholders.

- **Technical Analysis**

Before the code update process begins, education includes a technical analysis of significant code changes since the last edition and a review of updates to electrical safety product Standards associated with those changes. The audiences at these seminars and workshops include design professionals, installers, and code enforcers. The ultimate goal is to familiarize them with the changes and to develop support for them.

- **Dispelling Misconceptions**

Education during the code update process involves the regulatory or legislative body charged with voting for the code adoption. While these entities are interested in cost and benefit analyses, education may also dispel misconceptions, misunderstandings, and outright falsehoods that may have been provided by opponents to the updates being considered.

- **Installation and Enforcement**

Once the updated code has been adopted and scheduled to go into effect, we want to see that the installation and use of electrical products is consistently interpreted and enforced. This becomes an opportunity to support and promote specific product Sections and application-specific technology, rather than the code as a whole.

Many NEMA Members continue to contribute and partner with a field rep during educational sessions and training events. This activity has led to many successful state code adoption campaigns and has raised the overall electrical safety of communities and society at large.

Learn more at www.nema.org/fieldreps. 📧

Bryan P. Holland, Southern Region Field Representative, NEMA

Advocating for Adoption

Madeleine Bugel, Manager, State and International Government Relations, NEMA

NEMA has consistently advocated for timely adoption of the most current version of the *National Electrical Code*® (NEC) without amendments that would diminish its effectiveness.

In the past, tenacious staff and Members working on code adoption have fought code adoption issues as they arose, usually after the advocates opposing timely and necessary code adoption got involved in legislative or regulatory processes. We must think differently about our approach.

Since there is no method for federal electrical code adoption, this battle comes on the state level. With each of the 50 states embracing a unique code adoption process, the methodology is different in every state. How, then, do we prepare for different processes and challenges in 50 distinctive states, to ensure that everyone in the nation has sufficient electrical protection?

Going Grassroots

NEMA is addressing this predicament not a moment too soon. With many states having adopted the 2017 NEC, our minds are turning to the NEC 2020 adoption. There is a high level of electrical safety in the country because of quality electrical products combined with proper installation and inspection. Many states, however, push back on expansions of electrical protection in the new versions of the NEC, sometimes even attempting to revert to the less comprehensive protection of older codes. We cannot allow this to happen.

In order to engage states on different levels than in the past, a significant part of this effort is engaging Members on the ground and helping legislators and regulators realize that this issue is close to home. A grassroots effort is vital to convincing the states that electrical safety provided by the NEC should be incorporated into a state's code.

The main elements of this campaign are:

- **Engage**

To facilitate local-level action, NEMA has an action center where constituents can contact their legislators and express their concerns about code adoption.

- **Invite**

Hosting legislators at facilities in their districts is another valuable tool to educate lawmakers about the benefits of timely code adoption.

- **Unite**

NEMA is working with other safety-minded groups to support a more comprehensive course to safety. We are spearheading a Safe Schools Codes and Standards Initiative through which we will hope to organize a coalition of groups such as the Secure Schools Alliance, Council of Chief State School Officers, and National Association of State Fire Marshals. This coalition will create a comprehensive code package that will cover school safety needs. A more cohesive approach to safety will help states keep their students safe.

As the political landscape changes, so must our tactics to advocate for timely code adoption. If you have questions or suggestions, contact Madeleine Bugel, madeleine.bugel@nema.org, 703.841.3222. 📧

e-Business Standards Enable Innovation

Marjorie Romeyn-Sanabria,
Communication
Specialist, IDEA

With the rise of automation and digitization in the electrical industry, companies may use an e-commerce platform in part because it is an increasingly popular business trend and they wish to remain relevant in a changing business landscape. E-commerce, when done correctly, is often the right choice for many companies: instead of hassling with paper catalogs that may or may not be up to date, or relying on manual processing, it can make a shopping experience convenient.

Convenience is a coveted quality in the realm of business and sales. But consistency and quality also matter. It is one thing to take a transaction from paper to the web, but it is quite another to deliver the same experiences that customers have come to know and trust. As technology continues to transform the electrical industry, e-business Standards not only support the convenience that is behind an e-commerce transaction but also provide important markers for safety, consistency, and reliability—all of which are equally if not more important than convenience.

Muhammad Ali, a program manager in NEMA's Building Infrastructure Division, explains how Standards shape not just the industry, but the economy as a whole.

"Standards in the electrotechnical industry are critical to manage the operation and efficiency of electrical infrastructure in economies. There are mandatory safety Standards that ensure the minimum health and safety requirements of a product. They need to be met before a product could go into the market."

A company with standardized e-business data will be more profitable and be easier to do business with, as will a company that develops a reputation for selling safe, reliable products that have been effectively tested. Standards are becoming less about companies vying to get a leg up on each other and more about collaboration to make sure everyone gets ahead.

Mary Shaw, director of e-business Standards at IDEA, observed that the attitude toward Standards has changed from combative to cooperative. No longer are companies wary of each other's use of e-business Standards, believing that e-business Standards will give them a competitive edge—they are working together to make the industry stronger.

"Companies realize that developing data Standards is not something that is meant for just one company but for the industry as a whole. By supporting and implementing Standards, everyone wins, everyone reduces costs, everyone can sell better. By supporting industry-developed Standards, companies can focus their attention on building better products, developing better internal and external processes, building brand loyalty with their customers and also with their staff, making the workplace more efficient, and giving their teams a reason to come to work every day."

Now is the time for companies to ask themselves how they can get their data up to industry standard before more changes in e-business Standards emerge, such as ETIM's translation to North American English, which will begin this October. Companies have the opportunity to not only boost sales but also shore up their reputations in the industry. 



CANENA Models Collaboration



Joel Solis, Senior
Conformity
Assessment
Manager, NEMA

On February 16, 1967, President Lyndon B. Johnson addressed Congress on the protection of American consumers, reporting that they faced a new problem: prosperity. He stated that American businesses responded with “matchless ingenuity and enterprise to produce the widest range of quality products ever offered for sale.”

While his aim was to implore Congress to look at national safety legislation and determine how it could be streamlined, the President expounded on the virtues of the free competitive market to resolve most problems through private enterprise.

Serving the U.S. electrical infrastructure, the electroindustry engaged in self-regulation through voluntary efforts to develop electrotechnical safety Standards. Much of that work is undertaken by Underwriters Laboratories (UL). Its Standards panels are made up of representatives from authorities having public safety responsibilities, electrical shock experts, electrical fire experts, casualty experts, and electrical manufacturers. The result is that the electrical industry continues to meet the challenges of satisfying ever-evolving consumer needs and maintain electrical safety through voluntary collaboration.

The signing of the North American Free Trade Agreement (NAFTA) in 1993 lifted tariffs on the majority of goods produced by the signatory nations. A free trade area, however, is not a common market. This meant that goods entering the trade area would have to comply with the country’s laws and technical

regulations. Technical regulations are subject to commercial policy, which creates obstacles to trade by imposing additional costs on its trading partners in order to comply with mandatory Standards that differ or fail to address advances in technology or installation practices.

NEMA identified differing regulations and Standards as a problem and sought a solution. With likeminded industry sectors, it created the Council for Harmonization of Electrotechnical Standards of the Nations in the Americas (CANENA), which provides the means to extend the model of voluntary collaboration to its counterparts in Canada and Mexico.

CANENA’s objective is to advance regional harmonization of electrotechnical product safety Standards for equipment intended for use in the North American-type distribution system by reducing technical barriers to trade caused by differing Standards, national conformity assessment services, and product installation criteria. NEMA Members recognize CANENA’s importance in facilitating market access through a transparent process of regional collaboration to achieve unprecedented market integration.

With more than 90 regionally harmonized electrotechnical safety Standards in place, it is remarkable how well the CANENA process relies on private enterprises to resolve technical problems in a free, competitive market. ☞

U.S. Submittals Gain IEC Acceptance

Ken Gettman,
Director,
International
Standards, NEMA

When considering global product distribution, it is often beneficial to pursue compliance with the International Electrotechnical Commission (IEC), unless a Standard developed in the United States has become the de facto world requirement.

The IEC, an international standards body, creates voluntary specifications that are adopted verbatim or with unique country deviations through most countries outside North America. Many IEC Standards are adopted as national requirements.

A number of existing IEC Standards are based on submittals from the U.S. that generally reflect requirements already in use in that market. The process

requires a technical advisory group to forward the work to the general secretary of the U.S. National Committee of the IEC, which then makes the formal submittal. Another option is for a U.S. representative in one of the technical committees to directly propose the development of a new Standard or updating an existing one.

There are many variations on these two methods, but the U.S., just like the other 150 countries in the IEC, is able to develop, submit, and frequently gain acceptance for projects initiated by its constituents. ☞



Making Safety Smart in Smart Buildings

The term “smart buildings” means different things to different people. In the area of life safety, the definition is based on how systems are integrated with one another so that they are not just providing information to each other but also causing things to happen from one system to another.

Because of the critical role they play in protecting lives and property, life-safety systems require a level of reliability and resilience far beyond that of other building systems and networks. Therefore, we have to be extremely careful about how we allow information from other systems to come into the life-safety system.

The design and specifications of life-safety systems are guided by building codes, Standards, and listings, with each controlled by different organizations. Listing entities like UL and FM Global regulate how much information can come into any life-safety system. There must also be some type of a barrier or gateway to prevent unauthorized or corrupted information from coming into a fire alarm system. Listed gateways can accomplish this. For example, you could take a Johnson Controls building automation system and a Simplex fire alarm system and get them UL Listed together, allowing them to send information in both directions.

Many manufacturers are active in developing codes and Standards, with some representatives sitting on specific committees like healthcare occupancy. Others may contribute to product listing documents, and still others may participate in committees that determine how products should be installed and maintained. We’re even involved with groups like the National Disability Rights Network that advocate for laws that promote equal access and notification of life-safety events.

Factoring in Safety

Building Automation and Control Network (BACnet) is a good example of interactive systems that promote equal access and notification. Developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), it is a common protocol that allows all types of systems to be on the same communication platform and thus send and receive information. BACnet is based on entities’ being able to define and identify other entities. For example, the lightning system recognizes what a smoke detector is when those entities are sent out to the network. It’s one of the most important methods we are using to communicate among dissimilar systems.

The use of sensors as part of the Internet of Things (IoT) is another factor. Occupancy sensors, for example, can tell where people are located in a building. Knowing that is a critical piece of information for first responders.

Another example would be a big parking garage next to a mall. Carbon monoxide detectors and occupancy sensors in the garage may indicate that the garage has become crowded. An integrated system can turn on fans to get fresh air moving throughout the building rather than telling the fire system to go into alarm mode. It’s performing a life-safety function but at a non-emergency level.

The future of smart buildings begins with awareness. The average building owner may not know that a lot of this life-safety technology even exists. One of my recommendations is to involve the authorities having jurisdiction (AHJs), local fire marshals, fire chiefs, and first responders. Another is to work with your design engineer. As you discuss preferences for windows, flooring, lighting, and so on, ask how these systems could integrate and what the benefits of integration would be. The bigger the facility, the greater the safety benefits. ☺

Rodger Reiswig, Vice President, Industry Relations, Johnson Controls Global Fire Protection Products

Mr. Reiswig is actively involved in several NEMA committees. He chairs the Fire, Life Safety, Security and Emergency Communications Board of Directors.

Roadmapping Seismic Conformance: Council to Initiate Guidelines for Electrical Equipment

Philip Caldwell,
Edison Expert,
External Affairs,
Schneider Electric

The electrical industry is currently void of a consensus-developed transparent rationalization Standard for planning and implementing product-specific seismic qualification for building code compliance. Without one, this task ultimately defaults to the authority having jurisdiction (AHJ) to sort out code compliance—a function that is most likely undertaken by those with no background or experience in electrical equipment.

A recently approved NEMA Strategic Initiative will inaugurate an Electrical Equipment Seismic Conformance Council (EESCC) to develop a roadmap and initiate an industry-developed Standard to define product-specific guidelines for compliance with the seismic provisions of commercial building codes.

The NEMA EESCC will:

- position NEMA Members to proactively lead and guide the seismic conformity assessment process of electrical equipment for commercial building code applications through the full product lifecycle;
- create a council of Members that are familiar with the market challenges as well as the technical challenges for conformance;
- establish a standards process for seismic compliance that can guide performance objectives of commercial building codes and adapt to future market-driven changes to them as they evolve;
- identify the best standards developing organization process, involvement, and structure; and
- initiate the development of an electrical industry Standard that is nationally recognized and accepted, including acceptance by the California Office of Statewide Health Planning and Development (OSHPD).

Launching an industry-recognized practice to qualify electrical equipment for compliance with seismic requirements found in commercial building codes may place NEMA as a leader in the entire electrical construction industry. This will reduce the cost of compliance with the seismic provisions of the International Building Code® (IBC) while increasing the confidence of compliance for all NEMA Members.

Benefits to Industry and Members

One long-term benefit would be a disciplined process for NEMA to maintain the role of “what to test” and proactively manage disruptive impacts of future building code changes. Another would be to defend against performance provisions being introduced that may not be feasible for electrical equipment.

New building code seismic development has just begun. As areas of the country move incrementally toward enforcement of building code seismic requirements, AHJs will be tasked with developing a process for accepting electrical equipment qualification. OSHPD is the first AHJ to fully enforce the seismic provisions of the U.S. commercial building code (ASCE/SEI 7 by reference) through the IBC construction quality deliverables of Chapter 17. As more AHJs move toward full enforcement, the what-to-test challenge will become defined by each AHJ repeatedly at maximum cost and minimum confidence.

The next cycle of ASCE/SEI 7 is underway, as is research into all aspects of code development and public policy to drive more widespread adoption and enforcement. All of these activities have far-reaching implications for NEMA Members. An appropriate standard of care eliminates risk for building design professionals, installers, and AHJs and must be proactively addressed by NEMA before it becomes a significant market disrupter.

If we do not act, we will find our markets increasingly subjected to enforcement of rules instituted by others outside of our industry. ⚡



QPS EVALUATION SERVICES, INC.

YOUR FULL SERVICE PARTNER IN PRODUCT CERTIFICATION

Are you tired of long delays, broken promises, and the high costs of service provided by your current certification agency? And are you looking for an alternative?

If yes, then QPS is your choice

Being a NRTL and fully accredited in the USA, Canada, and internationally, and having earned a reputation of being a "breath of fresh air" in the conformity assessment industry, QPS is...

**Big enough to compete,
small enough to care**

In addition to testing/certification for the North American market of such products as medical devices, consumer products, industrial/machinery equipment, and equipment used in explosive atmospheres, we also offer field evaluation, CE marking assistance, ATEX, IECEx, IECEE/CB Scheme, and consulting services.

By partnering with us, clients get an unmatched service through

- 24-hour quote response time
- Flexible scheduling and fast product approval and entry to market
- No hidden costs
- Direct interface with a dedicated project engineer
- Direct access to senior management

Join the thousands of fully satisfied clients and choose QPS for your next certification project, and rest assured that **your product will be on market, on time, on budget!**

www.qps.ca • Info@qps.ca • 1-877-746-4777

MARKET IT

However you say it,
we have you covered.



REGULATORY COMPLIANCE FOR THE US AND CANADA

When you require testing and certification for your products, choosing an accredited Nationally Recognized Testing Laboratory (NRTL) like TÜV Rheinland will give both you and your buyers confidence in your product's quality.

Count on TÜV Rheinland as your premier global partner for US and Canada Listing, Certification and Field Labeling services. Because in this interconnected world - **safety, performance and interoperability matter.**

info@tuv.com | 1-888-743-4652 | www.tuv.com/us



NEMA Ensures Critical Lighting Products Remain Available in Louisiana

Acting on behalf of Member companies in the NEMA Light Source Section, NEMA sought and obtained an additional two-year exemption for critical lighting products from strict mercury content limits applicable in Louisiana. Had the Louisiana Department of Environmental Quality (DEQ) not approved this extension, lamps used for most outdoor lighting systems as well as fluorescent lamps employed in a variety of specialized applications would have become unavailable to Louisiana consumers and businesses.

With a maximum of 10 milligrams per mercury-added fabricated product, Louisiana's mercury threshold is the strictest in the nation. Rhode Island's law is similar in structure and sets comparable limits on mercury content, but it explicitly excludes all fluorescent lamps as well as commonly used high-intensity discharge (HID) lamps such as metal halide, high-pressure sodium, and mercury vapor types. This is no minor technical issue.

As NEMA explained in its application to the DEQ, the broad spectrum of lighting products subject to the statutory threshold fulfill numerous general service and specialty lighting requirements. HID lamps have long been the preferred lighting technology for gymnasiums, warehouses, large-scale manufacturing, and other large indoor spaces, as well as outdoor activity sites such as stadiums and ball fields, roadway interchanges, and parking lots. Other HID products provide the high illuminance and radiance needed for sensitive industrial and medical applications.

Low-volume, specialty fluorescent lamps also meet crucial lighting needs in a multitude of uses. For example, bilirubin lights (also called "bili lights" or phototherapy) are a treatment for jaundice in newborn infants. The lights help jaundiced babies excrete excess bilirubin, which may lead to brain damage and other serious conditions. Another example is infrared lamps that are central to heat lamp therapy, which is used for pain relief, wound healing, and treatment of damaged skin. Outside of the medical arena, reprographic lamps are relied upon for processes such as platemaking, photoresist exposure, imaging, and others that require the use of ultraviolet energy.

Clearly, a law that prevents or restricts the sale of these lighting products in Louisiana would have enormous economic and social implications. No technically feasible alternatives exist that constitute direct, drop-in replacements for these products, so removing them from the local market would force consumers and businesses to purchase and transport them from neighboring states. This would be a costly and unnecessary imposition, especially since the majority of these lamps are recycled at end-of-life and present very little risk of mercury exposure or release to the environment.

The DEQ expressed no reservations about extending the exemption, but Louisiana law limits such extensions to two years, which means NEMA will need to revisit the issue in 2020. Additional information can be obtained by contacting Mark Kohorst of NEMA Government Relations at 703.841.3249 or mark.kohorst@nema.org.

SPOTLIGHT

I Am NEMA



Zijun Tong, Program Manager, NEMA

As a program manager in NEMA's Building Infrastructure Division, I manage technical activities in the Residential and Commercial Controls; Electric Resistance Heating; Low Voltage Distribution Equipment; Ground Fault Personnel Protection; and Pin and Sleeve Plug, Receptacle, and Connector Sections.

Before joining NEMA, I worked at a nationally recognized testing laboratory. I have a passion for making a difference, helping Member companies manufacture safe electrical products, and achieving goals through consensus-based standardization and harmonization work.

With emerging technologies and new innovations yet to come, I enjoy being part of a collaborative environment to facilitate standardization of newer processes and policies as well as maintain our current level of safety measures among various industries.

I am excited and happy to be part of the NEMA family. 

New Tests for Smoke Alarms and Detectors

In order to improve the detection of fires from synthetic materials and to reduce unwanted alarms, new tests have been developed for all smoke alarms and smoke detectors. Beginning May 29, 2020, all smoke alarms and detectors seeking to be listed as complying with ANSI/UL 217 and ANSI/UL 268 product Standards will have to pass new flaming and smoldering polyurethane (PU) foam tests as well as a new cooking nuisance resistance test.

The PU fire tests address changes in materials used for interior furnishings and building materials. Forty years ago, furnishings found in homes, hotels, and offices were primarily made of natural materials like cotton, wood, or silk. Most furniture available in the last 20 years, however, utilizes polyurethane foam for padding, and polyester or nylon for coverings, carpet, and drapes. During the mid-1980s, construction methods changed from using solid wood for studs, trusses, and joists to widespread use of engineered lumber made from wood and synthetic epoxies.

Fires from synthetic materials burn hotter and faster than those from natural materials. The 2008 National Institute of Standards and Technology (NIST) report *Performance of Home Smoke Alarms: Analysis of the Response of Several*

Available Technologies in Residential Fire Settings concluded that people today have three minutes of available safe escape time in “flaming” fires compared to 17 minutes in the late 1970s.

The cooking nuisance resistance test was necessary to meet a new requirement in the 2013 edition of NFPA 72 National Fire Alarm and Signaling Code® that requires all smoke alarms and smoke detectors installed between six feet and 20 feet from a stationary or fixed cooking appliance to be listed for resistance to normal cooking activities, which are the leading cause of unwanted alarms.

The effective date for this requirement was originally January 1, 2016, but it was subsequently changed to January 1, 2022, to allow additional time to gather technical data, develop performance tests, obtain approval from the UL Standards Technical Panel (STP), and allow time for manufacturers to design, test, and list their products.

The new PU foam tests and nuisance resistance test were added to ANSI/UL 217 for smoke alarms and ANSI/UL 268 for smoke detectors. In August 2016, UL announced its certification laboratory will not require smoke alarms or smoke detectors to comply with the new tests until 2020. 📧

Standard for Shielded Power Cable Now Available

Ann Brandstadter

Manager, Standards Publications and
Marketing, NEMA

ANSI/NEMA WC 74/ICEA S-93-639-2017
5-46 kV Shielded Power Cable for Use in the Transmission and Distribution of Electric Energy covers the requirements for conductors, insulations, protective coverings, and general constructional and dimensional details common to most shielded types of wires and cables. This edition includes a new section for cable insulation

qualification requirements. It is available for \$242 in hard copy and electronic download.

Other recently published Standards include:

- **ANSI C80.6-2018** *American National Standard for Electrical Intermediate Metal Conduit (EIMC)*, available for \$76 in hard copy and electronic download.
- **NEMA RN 1-2018** *Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit*, available for \$58 in hard copy and electronic download. 📧

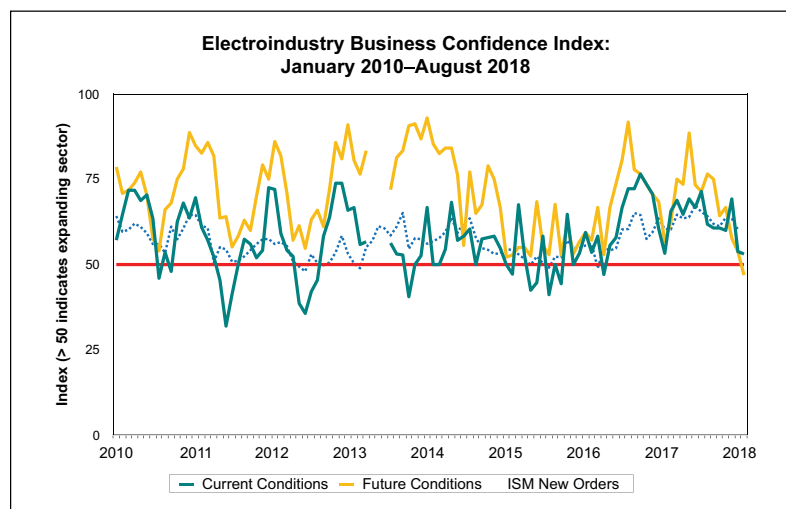
Little Change in EBCI's Current Conditions, but Tariffs Darken Six-Month View

The current conditions component of the Electroindustry Business Confidence Index (EBCI) declined slightly in August but remained in expansionary territory at 53.8. A majority of respondents indicated conditions were unchanged from last month's robust environment. The share of those who reported better conditions crept up marginally but so did the proportion that noted facing worse conditions. Multiple panel members mentioned tariffs were a concern that have already begun affecting their businesses.

For the first time since February 2009, the future conditions component dropped below 50, suggesting a potential industry deceleration six months from now. The nearly 7-point decline to August's 46.9 reading was driven largely by a sharp uptick in the share of panel members that reported expecting worse conditions. Most comments pointed to concerns about the new tariffs' effects—on both supply and demand—even as others

expected policy and political uncertainties to fade by that time.

Visit www.nema.org/ebci for the complete August 2018 report. @



Statement of Ownership

Statement of ownership, management, and circulation (required by 39 U.S.C. 3685)

1. Publication title: *electroindustry magazine*. 2. Publication number: 000-9669. 3. Filing date: 9/14/2018.
4. Issue frequency: monthly.
5. Number of issues published annually: 12. 6. Annual subscription price: \$0.
7. Complete mailing address of known office of publication: National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Rosslyn, VA 22209-3811. Contact person: Pat Walsh, 703-841-3225.
8. Complete mailing address of headquarters or general business office of publisher: National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Rosslyn, VA 22209-3811. 9. Full names and complete mailing addresses of publisher, editor, and managing editor: Publisher: National Electrical Manufacturers Association, Tracy Cullen, Senior Director, Communications & Marketing; Editor & Managing Editor: Pat Walsh.
10. Owner: National Electrical Manufacturers Association, 1300 North 17th Street, Suite 900, Rosslyn, VA 22209-3811. 11. Known bondholders, mortgagees, and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages, or other securities: None. 12. Tax status: The purpose, function, and nonprofit status of this organization and the exempt status for federal income tax purposes have not changed during preceding 12 months. 13. Publication title: *electroindustry magazine*. 14. Issue date for circulation data below: August 2018.

15. Extent and nature of circulation, average no. copies each issue during preceding 12 months: A. Total number of copies: 4,595. B. Legitimate requested distribution (1) outside county requested mail subscriptions stated on PS Form 3541: 3,352. (2) in-county requested mail subscriptions: 0. (3) sales through dealers and carriers, street vendors, counter sales, and other requested distribution outside USPS: 0. (4) requested copies distributed by other mail

classes through the USPS: 44. C. Total requested circulation: 3,396. D. Non-requested distribution: 0. E. Total non-requested distribution: 0. F. Total distribution: 3,396. G. Copies not distributed: 1,199. H. Total: 4,542. I. Percent requested: 100%.

16. Electronic copy circulation, average no. copies each issue during preceding 12 months: A. Requested electronic copies: 48,679. B. Electronic copy circulation: 48,679. C. Total requested copy distribution + requested electronic copies: 52,074. D. Percent requested circulation (print and electronic copies): 100%.

Copies of single issue nearest to filing date. A. Total number of copies: 4,305. B. Legitimate requested distribution (1) outside county requested mail subscriptions stated on PS Form 3541: 3,256. (2) in-county requested mail subscriptions: 0. (3) sales through dealers and carriers, street vendors, counter sales, and other requested distribution outside USPS: 0. (4) requested copies distributed by other mail classes through the USPS: 36. C. Total requested circulation, 3,301. D. Non-requested distribution: 0. E. Total non-requested distribution: 0. F. Total distribution: 3,301. G. Copies not distributed: 1,004. H. Total: 4,305. I. Percent requested: 100%. **Electronic copy circulation nearest to filing date.** A. Requested electronic copies: 50,244. B. Electronic copy circulation: 50,244. C. Total requested copy distribution + requested electronic copies: 53,545. D. Percent requested circulation (print and electronic copies): 100%.

17. Publication of statement of ownership will be printed in the October 2018 issue of this publication.

18. Signature and title of editor: Pat Walsh, Editor in Chief. Date, September 14, 2018. I certify that all information furnished on this form is true and complete. I understand that anyone who furnishes false or misleading information on this form or who omits material or information requested in the form may be subject to criminal sanctions (including fines and imprisonment) and/or civil sanctions (including civil penalties).

PULLPro®

THE TOTAL PACKAGE

...AND THEN SOME.

THE NEW PULLPRO® NOW HAS
250 MORE FEET!

Visit www.encorewire.com/pullpro
or call 1.800.962.9473.



LIGHTER, STRAIGHTER, FASTER, AND NOW LONGER...IT'S JUST THAT SIMPLE™



ENCORE WIRE®

encorewire.com