



Forces Driving Change in the NEC[®]



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**This session is eligible for
1 Continuing Education Hour**

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- Have your badge scanned at the door
- Attend 90% of this presentation
- Fill out the online evaluation for this session: www.necanet.org/neca2018

The Pace of Change

- The electrical industry is changing and evolving
- Change is not necessary, because survival is not W.E. Deming
- Installation and safety rules must change and accordingly
- Codes and standards must stay relevant to be adoptable and effective
- Workplace safety rules must be practical, enforceable, understandable



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Forces and Drivers

- Impactful Technology – Disruptive Technologies
- Speed of technology development and evolution
 - What is possible is here, and coming faster
- Faster and cheaper computing power – enabling and driving society's (customer) needs and wants

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Smart Technologies

- Smart Device Use for communications and resources
 - 7.4 B people on Earth (2016)
 - 1.8 B connect through smart devices (2010)
 - 3.0 B connect through smart devices (2017)
 - 5.0 B will be connected (2022-2025)
- The more connectivity and communication, the more needs of society (driving capacity needs and opportunity)



Power Production and Use

- Smart Grid Initiatives – U.S. Department of Energy
- Renewable energy – 25% of the earth's power (2016)
- Drives the need for installing and maintaining energy storage – lots of it
- Drives the need for effective and conservative use of energy
- Drives the need for new use methodology such as active micro- and macro-grids
- Significant business opportunities for NECA and IBEW

Leadership in Energy Management

- Energy Storage, Control and Use
- New electrical load technologies (more for less using LED loads, etc.)
- Energy management services (NECA and IBEW members provide) NEC® Article 750
- Intelligent buildings (designed and installed by NECA and IBEW members)
- Smart Cities and the Internet of Things (IoT) and the Industrial Internet of Thing (IIoT)



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Electrical INDUSTRY Leadership

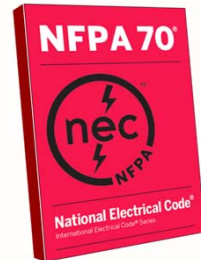
- Electrical Contractors and Electricians
 - NECA Contractors and Management
 - Foremen and Project management
 - IBEW Electrical Workers
- Application and Use of New Technologies
 - Construction Methods and Means
- Electrical and Overall Safety (tools/work practices)
- Pacing Knowledge and Skillsets (staying trained)
 - Requires world-class training and continuing education



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Evolution of Codes and Standards

- Development of Codes and Standards is evolving
 - ANSI commented “Less cyclical, more real-time”
- Not your grandfather’s NEC® any longer
- Electrical Codes and Standards need to remain relevant
 - Changes and new requirements inevitable
- NEC® rules need to support the safe, sound growth of expanding electrical technologies (existing and new)
- Solar, wind, storage, EVs, others (V2X technologies), POE, and so forth



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Communication and Correlation

- Effective communication and correlation between electrical standards in development (including electrical product standards)
 - NEC® (2020 in development)
 - NFPA 70E®
 - NFPA 70B®
 - National Electrical Safety Code® – NESC®
 - Energy Codes
 - ASHRAE 90.1
 - ICC Energy Code

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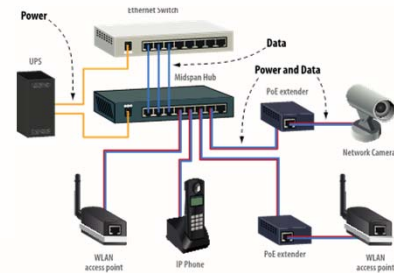
Collaboration Essential

- Between electrical codes and standards development organizations
 - NFPA
 - NEMA
 - NECA
 - IEEE
 - ASHRAE
 - ICC
 - UL, CSA, INTERTEK, others
- Cannot have tunnel vision or operate in a vacuum

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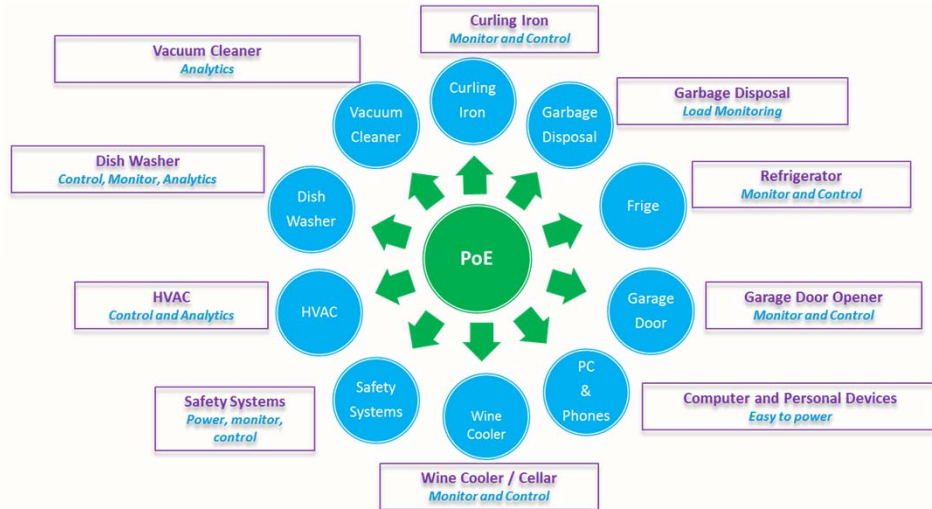
NEC[®] Progression 2011 – Present

- Renewable Energy Rules
 - Large Scale PV Systems
- DC Micro-grids
- Energy Storage Systems
- Energy Management Systems
- Internet of Things (IoT) and Power Over Ethernet (PoE)
 - New lighting, sign, communication technologies
- EV wired/wireless equipment charging and V2X Technologies



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Power Over Ethernet



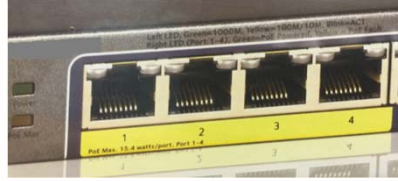
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Power Over Ethernet Devices



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Effects on Standards



- Consumer choice creates chaos
 - “Democracy is the worst system – except for all the others”
- Standards make a difference



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Certifying POE Devices – IEEE 802.3

- Identifies interoperable PSEs, PDs
- Includes power class for PDs & PSEs
- First certifications announced Jan. 2018



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Electrical Loads and Calculations

- Electrical Load Calculations – Need to evolve
- Need to reflect conventional (legacy) methods and new technologies
- NEC® Article 220 requirements not current – Need to include both conventional and energy efficient load calculation requirements
- Working to include more practical load calculation values in VA per square foot
 - ASHRAE 90.1 Studies used as a basis

Staying Current and Relevant

- It comes down to education, communication and leadership
- Maintaining current skillsets (training others to do and to lead)
- Succession planning (identify the shining stars)
- Managing attrition...work needed here in workforce development



Safety as a Core Value

- As leaders we have no greater responsibility than the safety of our people; they are our greatest asset.
- Safety is a responsibility shared by the employer and employee
- Leading by example in safe work practices and policies
- If you allow it, it is as good as authorizing it.



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Questions?

Don't forget...

- 9:00 am – 1:00 pm – NECA Show
- 1:15 pm – 2:30 pm – Closing General Session with Jon Dorenbos
- 7:15 pm – Closing Celebration – Foreigner

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