Presenter Biography

- Senior Field Representative - Southern Region
- NFPA 78, NFPA 1078, and NFPA 780
- ICC Commercial Energy Code Development Committee
- 41 ICC Certifications
- 24 FEMA Certifications
- Certified Standards Professional (CStd)
Strength in numbers fused with sector expertise is the hallmark of the National Electrical Manufacturers Association (NEMA). We are nearly 325 Member companies representing a wide range of electrical equipment and medical imaging manufacturers that make safe, reliable, and efficient products and systems serving seven major markets:

- Building Infrastructure
- Building Systems
- Lighting Systems
- Industrial Products & Systems
- Transportation Systems
- Utility Products & Systems
- Medical Imaging

Our combined industries account for 370,000 American jobs in more than 6,100 facilities covering every state. These industries produce $124 billion in shipments and $42 billion in exports of electrical equipment and medical imaging technologies per year.

NEMA publishes more than 700 electrical and medical imaging Standards and technical papers that cover millions of Member products. We believe that Standards play a vital part in the design, production, and distribution of products destined for both national and international commerce.
Presentation Topics

✦ Industrial Control Panel - Industry Issues
  • Marketplace Barriers - Opportunities and Challenges
  • Standards Development and Harmonization

✦ Introduction to the Field Representative Program
  • Codes and Standards Development
  • State and Local Codes and Standards Adoption Activity
  • Education and Training Activity
  • Core Industry Services

✦ NFPA Requirements for Industrial Control Panels
  • NFPA 79 Chapters 9, 10, and 11
  • NFPA 70 (NEC) Article 409

✦ Opportunities and Challenges in the Field
Transforming the Future

Industrial Control Panel
Industry Issues
Industrial Control Panel - Industry Issues

✓ UL 508A MTR Qualification Test
✓ Supplier-Manufacturer Collaboration
✓ Industry Awareness and Visibility
✓ UL 508A Industrial Control Panels
✓ Standards Harmonization
Topic 1: UL 508A
“MTR qualification test”

- 80 question, 4 hr exam
- No industry input on questions
- One person (minimum) per site
- Website makes no mention of any benefit for Manufacturer
Topic 2: Supplier-Manufacturer Collaboration

- Industrial Control Panels are growing in complexity
- Connected products, trouble-shooting, and component selection is complicated
- Strong relationships between suppliers and manufacturers can reduce downtime and increase sales
Topic 3: Added visibility for your organization

- Building awareness opens opportunities
- Website drives traffic and opportunities to your company
- Differentiate your company from the thousands of others in the market
Topic 4: New Edition of UL 508A

- New 3rd edition with effective date of July 2020
- New structure
- Additional revisions introduced with future effective dates
- Are there benefits of having a broad industry interpretation of the new requirements?
Topic 5: Update UL 508A

- Standards are designed to be easy-to-understand and help make safe products

- Are there gaps in the standard, ambiguous paragraphs, conflicting requirements?

- How does the standard differ from the requirements of Art. 409 of the NEC?
Topic 6: Harmonization

- UL, CSA and the NEC all have (different) defined requirements for Industrial Control Panels.

- Would there be a benefit in working so that these differences are eliminated?

- Would harmonization between one or more of these groups create other issues?
Introduction to the NEMA Field Representative Program
1. Mike Stone: AK, AZ, CA, HI, ID, MT, NV, NM, OR, UT, WA
2. Tim McClintock: AR, CO, IA, IL, IN, KS, KY, MI, MN, MO, ND, NE, OH, SD, WI, WV, WY
3. Bryan Holland: AL, FL, GA, LA, MS, NC, OK, PR, SC, TN, TX, USVI, VA
4. Jack Lyons: CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT
Field Representative Program

✔ Develop and maintain relationships with Authorities Having Jurisdiction and other Electrical Professionals throughout the nation

✔ Provide training on the latest Codes, Standards, and the proper installation and use of NEMA Member products
  ▪ 50+ PowerPoint Presentations / 25+ Whitepapers / Engineering Bulletins

✔ Advocate NEMA positions pertaining to electrical safety, efficiency, resilience, and sustainability

✔ Assist in solving problems in the field involving the installation of NEMA Member products
Codes and Standards Development

NFPA Codes and Standards

ICC Codes (I-Codes)
Codes & Standards Development

✓ National Committee Participation
  ➢ NFPA 70, 70B, 78, 780, 915, and 1078 Technical Committees
  ➢ ICC Commercial Energy Code Development Committee

✓ Public Input / Proposal Development

✓ Hearing Testimony

✓ Industry Partner Collaboration / Stakeholder Engagement
## Codes & Standards Adoption Activity

- **National Electrical Code**
- **Building, Fire, & Life Safety Codes (ICC / NFPA)**
- **Energy Codes (ICC / ASHRAE)**

### State Adoption Details

<table>
<thead>
<tr>
<th>State</th>
<th>Adoption By</th>
<th>NEC Edition: Adoption and Effective Date</th>
<th>IRC Edition</th>
<th>IRC Part VIII</th>
<th>Promulgating Agency</th>
<th>Date Last Change Made to Report</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>State</td>
<td>2017: Adopted and Effective on 5/30/2018</td>
<td>No</td>
<td>No</td>
<td>The Office of the State Fire Marshal adopts the International Building Code, International Fire Code, International Mechanical Code, The State legislature adopts the Uniform Plumbing Code and the National Electrical Code</td>
<td>7/1/2018</td>
<td>There is little enforcement as there are only 3 inspectors covering the entire state outside of Anchorage, Fairbanks, and Juneau. The state Division of Labor Standards and Safety enforces the electrical codes. The Mechanical Inspection Section has jurisdiction over the electrical inspection and adoption process. The electrical code may be found [here](<a href="http://north">http://north</a> Dakota.com/govt/alaska/AACFile/00/Chapter0700/00/000.txt).</td>
</tr>
<tr>
<td>Arizona</td>
<td>Local Jurisdiction</td>
<td>No State Adoption; See select jurisdictions below</td>
<td>2018</td>
<td>N/A</td>
<td>- There is no statewide adoption in Arizona. Most major jurisdictions including Phoenix and Tucson communities have recently adopted the 2017 NEC, moving directly from the 2014 NEC and are now over the 2016 NEC.</td>
<td>1/1/2019</td>
<td>- County/Municipality NEC regulation only -</td>
</tr>
</tbody>
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Codes & Standards Adoption Activity

✔ Monitoring & Reporting:
  ➢ Code Adoption Task Force and Toolkit:
    ▪ Maps, Reports, Guidance Documents, State Playbooks
  ➢ Council, Section, Technical Committee, Task Group Listserv
  ➢ Code Alerts
  ➢ Intelligence Report Submittal

✔ Regulatory & Legislative Action:
  ➢ Committee Work (State and Local)
  ➢ Hearing Testimony / Public Comment (State and Local)
  ➢ Advocacy, Networking, Education
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. Many NEMA Members have and 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.
Education & Training Activity

Education & Training Events:
- Conferences, Trade Shows, Forums, Workshops
- In-Person, Webinars, YouTube
- Industry Partners, State/Local Jurisdictions, Individual Companies

Education & Training IP:
- NEMA Developed Presentations and Resources
- Industry Partner Presentations and Resources
- Collaborative Presentations and Resources
Core Industry Services

Product Development

Key Individuals and Resources

State and Local Agency and Industry Insights

Market Trends

Natural Disaster Response

Conflict Resolution
Field Representative Program
NEMA’s field representative program serves NEMA members by promoting the use and adoption of the National Electrical Code® (NEC®) and by monitoring regional developments of importance to the electroindustry. As advocates of safe electrical systems and installations, NEMA field representatives also make a valuable contribution to the public safety.

› The Field Program One-Pager
› The Field Program: Serving NEMA Members and Promoting Public Safety

NEMA has four Field Representatives located in regional offices around the country. Their regions of coverage are aligned with the International Association of Electrical Inspectors (IAEI) Section Regions. The representatives are:

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   Region: AR, CO, IA, IL, IN, KS, KY, MI, MN, MO, ND, NE, OH, SD, WI, WV, WY

3. Bryan P. Holland, Southern Field Representative
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   Region: AL, FL, GA, LA, MS, NC, OK, SC, TN, TX, VA

4. Jack Lyons, Northeast Field Representative
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   Cell: 413.695.2689
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   Region: CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT
NFPA Requirements for Industrial Control Panels

❖ NFPA 79 - Electrical Standard for Industrial Machinery

- 2021 Edition issued on 10/5/2020
- Aligned with Article 670 of the NEC
- Chapter 9 covers “Control Circuits and Control Functions”
- Chapter 10 covers “Operator Interface and Control Devices”
- Chapter 11 covers “Control Equipment”
NFPA Requirements for Industrial Control Panels

NFPA 70 - National Electrical Code

- 2020 Edition issued on 8/25/2019
- 4,006 Public Inputs submitted to the 2023 NEC (First Draft Meetings being held 11/30/2020 through 1/23/2021)
- Article 409 covers “Industrial Control Panels”
  - Other applicable requirements of the NEC are found in Table 409.3
  - All requirements in Article 90 and Chapters 1-4 apply
  - Part I: General, Part II: Installation, Part III: Construction Specifications
  - Applicable to ICP intended for general use and operating at 1000 volts or less
NEC Article 409

Part II. Installations

409.20: Supply Conductors = 125% of full-load currents for heating loads and the highest rated motor + 100% all other loads operating simultaneously

409.21: Overcurrent Protection

- (A) shall comply with Parts I, II, and IX of Article 240
- (B) located ahead of the ICP or within the ICP
- (C) rated not greater than the sum of the largest branch-circuit overcurrent device in the ICP + 125% of full-load currents for heating loads + 100% of all other loads operating simultaneously
NEC Article 409

Part II. Installations

409.22: Short-Circuit Current Rating

- (A) the SCCR must exceed the available fault current
- (B) where the SCCR is required to be marked per 409.110(4), the available fault current and calculation date shall be documented and made available to those authorized to inspect, install, or maintain the ICP

409.30: Disconnecting Means = shall comply with Part IX of Article 430 where motor loads are supplied

409.60: Grounding = multi-section ICP shall be bonded together with an EGC sized per Table 250.122 and used to connect all EGCs. An equipment grounding termination point is also required in single-section ICP
NEC Article 409

Part III. Construction Specifications

409.100: Enclosures = comply with Table 110.28 (NEMA 250)

409.102: Busbars and Conductors
- (A) shall be protected from physical damage and be held firmly in place
- (B) phase arrangements shall be “A, B, C” front to back, top to bottom, or left to right.

409.104: Wiring Space
- (A) max fill of 40% for feed-through or tapped conductors entering the ICP / max fill of 75% for the conductors, splices and taps (312.8)
- (B) wiring bending space shall comply with 430.10(B)

409.106: Spacings = comply with Table 430.97(D)
NEC Article 409

Part III. Construction Specifications

409.108: Service Equipment = shall be suitable for use as service equipment and provided with main bonding jumper capabilities

409.110: Marking

- (1) manufacturer’s name and trademark
- (2) voltage, number of phases, frequency, full-load currents
- (3) to indicate that more than one disconnecting means is required to de-energize
- (4) short-circuit current rating (SCCR)
- (5) as suitable for use as service equipment (SUSE rated)
- (6) electrical wiring diagram
- (7) enclosure type number (110.28 / NEMA 250)
Opportunities and Challenges in the Field

✅ Opportunities:

- Industry Resource Development (Engineering Bulletins, Whitepapers, Training Presentations, Article Publication)
- Live Training Webinar Collaboration
- Industry Partnership Development

✅ Challenges:

- OSHA 1910, Subpart S (1910.303a and 1910.399)
- “We only approve listed equipment” states and local jurisdictions
- SUSE, SCCR, AFC, AIR, FLC = “Too Many Acronyms”
The Association of Electrical and Medical Imaging Equipment Manufacturers

THANK YOU FOR YOUR ATTENDANCE!

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