ECHL

THE WIRE

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MARCH 2023

The Presidents' Letter

For this March 2023 edition of ***The Wire*** I hope all of our members are doing well and enjoying this mild winter. As spring approaches, electrical work is even in higher demand with continued shortages of material and labor.

Our February 13th general membership meeting was attended by 47 members. Nick Jewell, with L.G. & E., and Metro Inspector Norb Thorpe gave an excellent presentation on solar installations. It was one of the best presentations to date. Elections were held for the Executive Committee. Congratulations to Mark Yates for being nominated and elected as a representative of the IEC.

Our February 11th continuing education class for contractors was well attended by 25 people. Breakfast and lunch were provided along with four excellent presentations.

The 50/50 drawing was for $47 and was won by Joseph Morris. Do not forget, if you have any suggestions on presentations, please get with one of the board members.

Dennis Steier will be conducting our March 13th presentation covering overcurrent protection.

As mentioned in the last several newsletters, the Department of Housing, Building, and Construction has gone to a new data base system which will no longer allow users to search for their licenses or their continuing education hours. We have had several members whose hours were not transferred from the old data base into the new one. So, for more information or any problem please call the Department at (502) 573-2002.

Our next general membership meeting is Monday March 13th at the Elks Lodge located at 2824 Klondike Lane. The meeting starts at 7:00 pm with sign-ins beginning at 6:30 pm. Hope you will be able to attend. If the opportunity arises, mention the Clearing House to your coworkers. I think they would be pleased with the continuing education presentations.

As Always Stay Safe and Work Safe
Steve Willinghurst
ECHL President

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MARCH 13, 2023 Code Program

Sign-in 6:30 P.M. - Program at 7:00 P.M.
ELKS LODGE # 8 - 2824 KLONDIKE LN -

Our March program will be presented by Dennis Steier on Overcurrent Protection. He will address fuse curves for clearing time of the protective device.

Dennis Steir will also go over the Code Questions in the March 2023 Wire.

See you Monday Evening, March 13, at 6:30 pm.

Stay Alert! Stay Informed! & Work Smart!

Supporting our Industry

***** Electrical Equipment Needed *****

ECHL is committed to supporting the electrical industry and the training required to further the trade. In doing so, we ask for your old equipment / inventory to use for training.

ECHL contractors and or suppliers - if you are cleaning out your old Inventory and have material (electrical Equipment) that is taking up space in your warehouse, the Iroquois High School Electrical Program is seeking material that can be used for teaching students about electrical products they may encounter in the field. Educating our future apprentices is the goal.

IEC is the hub for most of the surrounding area's for the electrical trade training schools. She has contacts for Jefferson County, Bullitt County, to Hardin County.

If you would call, Erin Pretorius or Stephanie at 502-493-1590 or email Erin at erin@iec-kyin.com to make arrangements for pick up or delivery.

Old or new! - Thanks for your support!

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FEBRUARY Code Questions

1. If you have a 2" rigid conduit with a 75C rated bushing, can you install conductors rated at 90C conductors in that raceway and be in compliance with the 2017 NEC? Where would you find this answer in the 2017 NEC?

   YES NO

   Section _____

2. Can you drill additional holes in the back of a box in the field to fasten the box and be in compliance with the 2017 NEC? Where would you find this answer in the 2017 NEC?

   YES NO

   Section _____

3. When you are looking for where a product is Permitted or Not Permitted by the NEC, what Part of the Article would it be in and what would be the dot number for them?

   Article _____ Dot _____

4. What is the required Wire-Bending space ta the terminal of and enclosed motor controller for 2 350 MCM conductors? Where would you find this answer in the 2017NEC?

   A) 16" C) 10"
   B) 14" D) None of above

   Section _____

5. Can you install a FS box with a cover and gasket for a termination in a Class 1 Division 2 environment and be in compliance with the 2017 NEC? Where would you find this answer in the 2107 NEC?

   YES NO

   Section_____

6. Can you make up your own extension cords with portable cord and components and meet the 2017 NEC? Where would you find this answer in the 2017 NEC?

   YES NO

   Section_____

Code Corner

Harmonics

If a facility or factory is experiencing power quality control problems they may have harmonics issues that they may not be aware of in their power system. Harmonic issues could possibly cause machinery to malfunction or fail because of this harmonic distortion. This may not make it impossible for the facility to operate, it depend on how much their electrical system can withstand and how suspect is their equipment to this harmonic distortion.

What causes Harmonics? Harmonic are caused by electronic equipment with nonlinear loads that draw current in abrupt short pulses. These short pulses cause distortion in the waveform, which in turn cause harmonic current to flow back into other parts of the power system. The harmonics are cause by many computers, laser printers, copiers, medical testing equipment, fluorescent lighting, UPS's and VFD's, on an electrical system. These type products operate at higher frequencies and older electrical system were not designed for this kind of equipment. If the facility has 15% or less there is normally not a real issue, when it exceeds the 15% level is when they will start experiencing issues.

In a 3 phase system with 3 individual phase conductors and a neutral conductor, there is no issue in a system that unless you may have a mode power supply used in computers that could produce very high third harmonic current. If you have a large number of computers installed the neutral conductor can carry higher current than the wire is capable of carrying creating a potential fire hazard.

In older facilities the transformers are also a potential problem if they supplying a large nonlinear, this could cause a loss of eddy currents and could cause excessive heating and degrading of the insulating materials in the transformer. This condition will eventually lead to failure of the transformer. They sell K rated transformer now that address these issues by the percentage of nonlinear load that it will be supplying.

All circuits containing capacitance and inductance have

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Top Three Code Violations Louisville Metro Inspections March 2023

These violations are costing you time and money.

1. NEC Article # 300.4 Protection Against Physical Damage

   Where subject to physical damage, conductors, raceways, and cables shall be protected.

2. NEC Article # 312.2 Damp and Wet locations

   Enclosures installed in wet locations shall be weatherproof. For enclosures in wet locations raceways or cables entering above the level of uninsulated live parts shall use fittings listed for wet locations.

3. NEC Article # 240.24(E) Not located in Bathrooms

   In dwelling units, dormitories, and guest rooms or guest suites, overcurrent devices, other than supplementary overcurrent protection, shall not be located in bathrooms.

Each of these articles listed above are associated with a violation. Please review the articles for compliance and keep in mind to follow through with the current approved CODE.

Being Turned down on a project, you lose money and time required to return to the job site for repairs to correct the violation.

We hope this will help save you time and money on inspection fees by reviewing the articles and making sure you have not violated the code before calling for the initial inspection.

Submitted by Arnold Hornback
Assistant Chief Electrical Inspector
Louisville Metro Dept of Codes and Regulations

Code Corner Cont'd

one or more resonant frequencies. When the resonant frequencies and the harmonic frequencies harmonic resonance can occur. This distortion can cause nuisance tripping of overcurrent devices in the electrical power system.

A harmonic analyzer is the most effective instrument for performing a detail analysis of the power quality; such testing can verify if harmonics could be the issue with the poor quality of power in the electrical system. By collecting this information and data it will allow you to evaluate and correct the system to deliver quality power with no down time

Submitted by Dennis Steier

LG&E NEWS

Connecting Permanent Services

Just a reminder for you when your job is inspected. When Louisville Gas & Electric crews come to connect your permanent service to the project, if there is something being fed from the temporary pole to the house such as (a furnace to keep the house warm) the crew is not allowed to disturb that connection and **"will not"** connect the permanent service. Thus, your hook up time will be delayed for another day or so. Please make sure nothing is connected or give the impression that something is in order to prevent any delays.

Submitted by Joel McCauley
Team Leader Electric Design Svcs
LG&E and KU Energy LLC

Three Steps to Capitalize on the Electrification Opportunity

How to prepare for a new future in the electrical industry

Affordable, reliable, and safe electricity is fundamental to modern life. Dating back to the 1880s, Thomas Edison's light bulb was one of the first applications of electricity — it radically challenged the status quo by introducing people to an entirely new type of energy. This new energy fostered many industries required to generate, transmit, and use the electricity fueling the economy and our livelihoods for the decades that followed.

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Three Steps to Capitalize Cont'd

The latest trend toward electrification — a shift in spending from high- to low-emissions assets — could create one of the largest reallocations of capital in a century and present massive opportunities for the electrical industry. As the Inflation Reduction Act (recognized as the largest investment in climate action in United States history) gains momentum, pressure mounts to better understand how to take advantage of new capital to effectively compete. Electrification in this era will demand new power generation, transmission, and distribution to support the growth of various trends like transportation electrification, onshoring and the requirements for more reliable and renewable energy.

Preparing for this shift and meeting the demands of this latest trend is causing the electrical community uncertainty at a time when it's already facing pressures from continued labor shortages and supply chain disruptions. Skilled labor shortages and the volatile supply chain will be the larger headwinds that could throttle growth, but perhaps the largest headwind will be the industry's ability to implement.

How is this wave of electrification different from the past? And how should electrical contractors, engineers, and plant personnel capitalize on opportunities? In this article, we will demystify "electrification" and outline three key steps to prepare for increased capital and support incremental people/process changes to become more resilient and successful as electrification evolves.

Market drivers shaping change
The world's energy diet is changing. For more than a century, fossil fuels (e.g., coal, oil, natural gas) have powered the world and generated electricity. Electrification (as defined today) refers to replacing technologies that use fossil fuels with technologies that use electricity as the energy source. Think of how internal combustion engines (ICE) are being supplanted by electric vehicles (EVs), commercial buildings are looking for more resilient and renewable power sources like solar, or how your household weed wacker is now battery-powered. The bottom line is the way in which power is generated, distributed, stored, and consumed is being reinvented.
To support this shift in the market, we will need dramatically more electricity that will have to be both more resilient and sustainable. According to the World Nuclear Association, projections are for electrical demand to grow two times from what it is today. This demand will be driven by several market drivers that are significantly different from the electrification efforts of the past, including:

- A wide range of international country, state, and local legislation and mandates require low-carbon solutions.

Three Steps to Capitalize Cont'd

- Various ESG and sustainability initiatives for numer- ous companies.

The Infrastructure and Investment and Jobs Act (IIJA) passed in 2021 and Inflation Reduction Act (IRA) passed in the summer of 2022 have nearly $2 trillion in funding to reduce the cost of low-carbon technologies.

These tailwinds will fuel the growth of this new era of electrification and should present exciting opportunities for electrical contractors. To help you capitalize on these opportunities, here are three key steps to consider:

1. Proactive project planning is essential to success.
With massive capital flowing into electrification efforts, the number of new opportunities will likely increase exponentially. The wide variety of large capital projects (like new manufacturing plants, large-scale solar projects, and electrifying fleets of vehicles) will change project scales and scopes unlike anything before. This will challenge contractors to strategically consider how to manage multiple, diverse project plans simultaneously to ensure success. Proactive project planning and supply chain execution have never been more essential to success.

2. Manufacturing and supplier ecosystem is the lynchpin to securing materials and executing at scale.
With continued strains on the supply chain, electrical contractors should exercise prudence when considering how to tackle new projects and take the long view when managing large-scale, multi-year jobs. Long gone are the days of short-term planning — not to mention having transformers, gear, and balance-of-system components readily available. Consider the current supply chain landscape and how to rely on your network of manufacturing/ supply partners to reliably source and secure the materials needed to execute at scale.

3. New era of construction will pave the way to hone a specialized skillset.
While daunting, this move toward electrification presents new, exciting opportunities for electrical contractors. Consider how you can sharpen specialized, high-valued skills to support this continued trend and position yourself as an expert. From EV charging systems and equipment to solar and battery energy storage to microgrids, the electrical industry is poised for great growth and transformation in the short term. How will you capitalize on these opportunities to set the foundation for long-term success?

Source: email EC&M Code Watch – 1/23/2023 Article by Nelson Squires