



THE WIRE

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SEPTEMBER 2022

PRESIDENTS LETTER

I hope everyone has had a good summer, is healthy, and ready to kick off another nine months of ECHL meetings and continuing education. I just came back from the monthly Executive Committee meeting. We had a lot of good discussion and have laid out the first four months of presentations. Our next general membership meeting is Monday September 12th at the Elks Lodge 2824 Klondike Lane. The meeting starts at 7:00 pm with sign-ins beginning at 6:30 pm.

I will be doing the presentation for the September 12th meeting. The topic will be residential battery backup systems. I will be discussing Article 480 *Storage Batteries*, Article 690 *Solar Photovoltaic (PV) Systems*, and Article 705 *Interconnected Electric Power Production Sources*.

Our October 10th meeting will cover the NFPA 70E Standard for Electrical Safety in the Workplace. The November 14th meeting will be conducted by Metro Inspector Norb Thorpe regarding common code violations. And the December 12th meeting will have a code panel assembled to answer code questions you may have run into on the job.

I am very disappointed to inform you that it does not look like the 2020 edition of the National Electrical Code is going to be adopted. The 2023 edition will be available in October of this year. Kentucky has never let an edition of the NEC go unadopted! In my opinion, it is a very dangerous precedent to set and I think it is irresponsible to let three years go by without an adoption!! There will be more discussion at the September meeting.

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.

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September 12, 2022 Code Program

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

Our September program will be presented by Steve Willinghurst on NEC Articles #480, Storage Batteries, and #690 Solar Photovoltaic (PV) Systems, and #705 Interconnected Electric Power Production Sources.

We have an exciting line up of programs set for the remainder of this year. If there is a topic that you would like for us to address, please feel free to mention it to anyone on the Board. We are always looking for topics of interest.

We encourage you to participate by asking questions.

Hopefully we'll see you Monday and Bring a Friend!!

Stay Informed, Stay Alert & 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!

SEPTEMBER Code Questions

1. NFPA 70 the National Electrical Code is on a how many year cycle?
A) 4 C) 5
B) 3 D) 2
2. What NFPA 70 Edition is Kentucky Currently enforcing?
A) 2020 C) 2017
B) 2014 D) None of Above
3. Can anyone submit a change to the National Electric Code?
YES NO
4. Who is responsible for the interpretation of the NFPA 70 the National Electric Code?
A) The Owner
B) The Designer
C) Authority Having Jurisdiction
D) You as the installer
5. Can you request permission for exceptions to the NFPA 70 requirements:
YES NO
6. Which standard would NFPA is considered?
A) Maximum C) Acceptable
B) Minimum D) None of Above

Code Corner

I hope you and your families have had a safe and memorable summer, they seem to come and go quicker than they did when we all were younger so enjoy them while you can.

The Kentucky Chapter IAEE held their summer meeting in Lexington the first week in August; this was just the second time we were able to gather since the Covid outbreak, the winter meeting in February was cancelled due to another outbreak. When I addressed the inspectors when we opened the meeting I had to get on my soap box regarding our current legislators and what they lack of concern in regard to electrical safety in our Commonwealth. Under the previous Governor the Department of Housing Building and Construction was pretty much gutted, he did away with advisor committees and made the HBC Board into a committee which actually has no power and left the process to one individual. The only way to reverse this danger has to be done legislatively which with the current make up is going to be an uphill battle.

Housing Building and Construction was formed after the Beverly Hills Supper Club fire that took 168 life due to a poorly installed electrical system, evidently the legislators were not born yet or don't have a very good memory. In Article 90 section **90.1 (A) Practical Safeguarding. The purpose of This Code is the practical safeguarding of person and property from the hazards arising from the use of electricity.** I always state during any of my training classes the NEC is a minimum standard for an electrical installation, this is what needed to do to satisfy the AHJ.

We are currently on the 21017 NEC and looks like we will be on for some time unfortunately, Steve Willinghurst and me have had more than a few conversations on this issue. First, do you know who is the Legislator and Senator is that represent you in Frankfort? If not find out and contact them with your concerns, we need to somehow push them to act on this for the electrical safety of every citizen of this Commonwealth.

Hope to see you at the September meeting.

Submitted by Dennis Steier

President's Letter Cont'd

Hope you will be able to attend the September 12th meeting.

As Always Stay Safe and Work Safe
Steve Willinghurst
ECHL President

LG&E NEWS

Off/ On Permits

When planning work that requires an off/on, please remember this requires **both** an off/on permit as well as an off/on inspection with the respective inspection authority. After the permit is pulled, the inspection can be scheduled with the inspectors. Once approved, contact the LG&E electric locator or the LG&E single point of contact line (502-364-8744/ new.biz@lge-ku.com). The LG&E electric locator will schedule the off/on with our construction department.

Homeowners are not able to pull a permit for an off/on. This must be done by a licensed electrician. Scheduling with LG&E must go through the electric locator and cannot be scheduled with our customer service department.

On the day of the off/ on appointment, it is important to please be on time to meet the construction crew. They will disconnect the service and leave their contact information. After the work is completed, contact the construction crew and they will return to reconnect the service. At that time, the inspection authority will need to be contacted to inspect the completed work.

Submitted by Joel McCauley
Team Leader Eng. Design Services
LG&E and KU Energy LLC

Navigating NEC Codes for Solar and Solar-Plus-Storage

Electricians and solar installers are required to navigate several codes and standards when installing solar photovoltaic (PV) and energy storage systems (ESS). Solar and energy storage equipment manufacturers introduce new equipment at seemingly lightning speed, and it can be difficult to keep on top of all the requirements. This article highlights the key codes and some of the top sections contractors working with solar PV and battery storage should be familiar with.

Top Three Code Violations Louisville Metro Inspections

SEPTEMBER 2022

These violations are costing you time and money.

1. 110.12 - Mechanical Execution of Work

Electrical equipment shall be installed in a neat and workmanlike manner..

2. 250.50 Grounding Electrode System.

All grounding electrodes as described in 250.52 (A)(1) through (A)(7) that are present at each building or structure served shall be bonded together to form the grounding electrode system.

3. 250.10 Protection of Ground Clamps and Fittings

Ground clamps or other fittings exposed to physical damage shall be enclosed in metal, wood, or equivalent protective covering.

Please review the NEC articles above. Each of these articles are associated with a violation. Please 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**

Navigating NEC Codes for Solar Cont'd

National Electrical Code

The most common code system designers, installers, and inspectors refer to for PV and ESS systems are NFPA 70, or the *National Electrical Code (NEC)*. PV systems have requirements that span multiple Code articles, so technicians need to navigate throughout the *NEC* to install code-compliant PV and ESS systems.

Article 690, Solar Photovoltaic (PV) Systems, is the primary article to reference when designing and installing PV systems. This article supplements, and in some cases modifies, the general requirements located in Chapters 1-4 of the *NEC*. Article 690 is one of the Code articles that sees substantial changes consistently cycle after cycle. These changes are not surprising given the rapidly advancing nature of the solar-plus-storage industry. Admittedly, Code seems to be often playing catch-up with advancements in solar technology and system components.

Of course, all of Article 690 is important for technicians to understand, but here are a few of the key sections that should be well understood and often lead to the most confusion.

690.12 is Another important section solar installers need to consider

Rapid shutdown requirements were added to the *NEC* during the 2014 Code cycle. The intention of rapid shutdown is to protect firefighters from the shock hazards they may encounter when interacting with a rooftop PV array while doing fire-suppression activities. When installed to Code with good attention to installation details, solar PV systems are inherently as safe as any other electrical system installed per Code. Code developers added rapid shutdown requirements specifically to reduce potential hazards to firefighters. Note that these rapid shutdown systems are not meant to be utilized during routine system-maintenance activities.

Rooftop solar PV array circuits must be controlled to reduce potential shock hazards to firefighters. To meet this requirement, the rapid shutdown section of the *NEC* provides multiple ways to meet the requirements based on the location of the circuit in relation to the PV array. Many PV installers use module-level power electronics (MLPE) to meet the Code rapid shutdown requirements. MLPE devices are typically mounted directly to the same racking system that supports the PV modules and are wired directly to the modules. These devices may be dc-to-dc converters or dc-to-ac inverters. MLPE can control the voltage on their respective circuits through a rapid shutdown initiation. The most common initiation is the loss of ac power that sends a signal to the MLPE devices to reduce the circuit voltage to an acceptable level per Code requirements. Other initiation devices that are properly labeled and accessible are acceptable

Navigating NEC Codes for Solar Cont'd

as well.

A recently released UL standard, UL 3741, is being employed by some manufacturers. This standard provides testing mechanisms for equipment manufacturers to prove their equipment provides effective and compliant shock protection for firefighters. This new standard and its application on the rooftop lead to new array configurations; inverter location strategies; and reducing or possibly eliminating the need for MLPE devices within the array while still meeting 690.12 requirements.

Another code article that will be nearly universally referred to during the Design and Installation of PV Systems is Article #705—Interconnected Electric Power Production Sources

This article covers the requirements for all power production sources interconnecting together, so it isn't unique to solar. Most installed PV systems are interconnected with the utility grid. Therefore, Article 705 is an integral part of installations.

The most often-cited sections of Article 705 are 705.11, Supply-Side Source Connections, and 705.12, Load-Side Source Connections. The reference to "side" is the main service-disconnecting means. Article 705 allows for the connection of power-production sources to either side of the main service-disconnecting means. This is an important consideration, as the associated requirements can be dramatically different depending on where the connection is located in relation to the main service disconnect. Additional Code articles that impact PV installations include 691, Large-Scale Photovoltaic (PV) Electric Supply Stations; Article 706, Energy Storage Systems; Article 480, Storage Batteries; and the entirety of Chapters 1 through 4, with Article 250 and Article 300 being commonly referenced.

The addition of battery storage to existing or new PV systems is growing rapidly across the US. In many cases, jurisdictions do not have much, if any, experience with these systems. As such, AHJs often rely on solar-plus-storage system installers for help understanding the proper Code requirements that apply to a given system. This information-sharing partnership is very similar to general PV systems 20 years ago, when the learning curve for Code officials was also steep. It is important for installers to recognize the codes and standards that apply to solar and energy storage systems. Be prepared to help educate your local code officials, especially in regions where solar PV is less common, or when manufacturers release new equipment and technologies.

Source: Internet search NEC Solar—Article by [Ryan Mayfield](#) - [July 11, 2022](#)