EC&M WEBINAR, NOVEMBER 29, 2018 – Q&A

Leveraging Prevention-Through-Design

Principles and Newly Revised Codes & Standards to Improve Electrical Safety

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Does a GFCI device in a 120V circuit eliminate the risk of electrocution from a tool plugged into that circuit?
No, a properly working GFCI device significantly reduces the risk of lethal shock.

If I have assessed arc flash incident energy, applied arc flash warning labels, and provided rated PPE, have I accomplished Prevention through Design?
No. Assessing incident energy and providing PPE is part of risk assessment and risk management. It is not prevention of the risk by a targeted design of the facility, system or process to minimize hazard and risk. A final analysis must be conducted to determine final actions, such as PPE, to mitigate residual risk or hazard.

Does compliance with the installation requirements of the NEC assure a safe design?
Generally, it results in a good installation, but that does not mean more cannot be done, or that it cannot be done better.

What codes and standards do I need to check if I am participating in a Process Hazard Analysis (PHA) for Emergency Diesel Engine Generator?
NFPA 70 National Electrical Code provides requirements for the electrical installation aspects of emergency generators. NFPA 37 Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines establishes criteria for minimizing the hazards of fire during the installation and operation of stationary combustion engines and gas turbines.

Referencing Slide 20: Is this quick disconnect only for fluorescent fixtures as indicated on the referenced code?
The requirement is in NFPA 70 article 430.130(G). It specifically addresses fluorescent luminaires that have double-ended lamps and ballasts that can be serviced in place. The requirement does not extend to other luminaires.

Will a copy of the presentation be available for download?
There will be a link available after the presentation for on demand viewing over the next year. We will not be distributing slides in pdf format.

We normally work on de-energized equipment. To ensure it is de-energized we need to do live-dead-live. Does this qualify as working energized?
In general, if equipment is approached to check for absence of voltage, until the absence is confirmed, one should assume it is energized. It is possible that the method used for checking involves little exposure. However, every situation is different. Even when various methods are used to remotely check if there is voltage, this lowers the probability that voltage is present. NFPA 70E recognizes that voltage testing is working on energized systems. NFPA 70E article 130.2(B)(3) provides an administrative method to perform voltage testing without requiring an energized work permit.

Do you have a list of voltage sensing equipment which can be installed on existing systems?
This information can be located via a web search. You may find that the UL listing varies for some of these types of equipment.

Can you clarify a crowbar fault?
A crowbar is any device that is used to force voltage to collapse. In power systems it is a device that, at some point, causes a bolted fault in the circuit so that voltage to a fault is diminished close to zero.

Some devices implement a crowbar with a controlled arc which causes the voltage to collapse to a lesser degree. This type of crowbar collapses voltage sufficiently to stop a fault arc but does not cause bolted fault current to flow.

What is the option to primary injection testing?
Modern circuit breakers with digital electronic trips, especially if they include metering and communications, may be checked several ways. Most circuit breaker models will have methods available to test the electronics for proper operation. It may be possible to verify correct sensing and signal scaling by looking at the metering in various ways. Some trip units are even able to time the mechanical tripping movement and can quickly flag if the mechanism is slowing for any reason. In some cases, this type of testing and data verification will provide more detailed data about a circuit breaker with much less effort, investment and interruption.

When will the updated IEEE 1584-2018 standard be issued to the public for use? When should Arc Flash analysis projects transition to utilizing the new IEEE 1584 calculations and methods?
IEEE 1584-2018 was published November 30th, 2018.

It was mentioned that there is no need for primary current injection testing on modern gear, or with new technology developments in breakers or trip relays. What would be a good method or action that would satisfy the need or FM requirements? We are converting to ACPRO-II trip units. Is there an electronic test or PM that we can do in lieu of primary current?
Here are some simplistic methods:

- If the electronic trip unit has communications and metering, bring current metering values to a single application and sum them, if possible, as vectors or as current magnitudes. Keep a trend of the sum loads versus sources; they should be about equal except for PF differences, measuring error and timing differences. If you can use kVW and KVAR, the PF error is reduced. If a circuit breaker loses CT information, the “error” or difference will climb and will show an association to a load.

- If the electronic trip unit has circuit breaker timing capability, which GE and ACPRO do, you can see if the mechanical system is operating properly without primary current injection testing. Between these two things you can see if the electronics, electromagnetics and mechanics of a circuit breaker are working properly.