

**Question of the Month** – What is the maximum rating of an inverse time circuit breaker used to provide branch-circuit short-circuit and ground-fault protection for a residential 240 VAC, single-phase, 1 ½ horsepower well pump motor, controller, and branch circuit? –See the correct answer on Page 2.

## Note from the Chief

With the start of the winter season comes a downturn in the weather, and ugly driving and working conditions. I would like to take this opportunity to remind everyone to allow some extra time to compensate for the weather and stay safe in everything that we do, both at work and at home. I hope that everyone enjoyed a safe and joyous Holiday Season with their family and loved ones.

Last month, we completed our annual inspector training. I want to thank our customers for their patience while our inspectors were out of the field for the training. We have found it very valuable to get all of our inspectors together for training to promote statewide consistency, especially with all of the newer inspectors. Our inspectors received 8 hours of solar photovoltaic (PV) training from two nationally recognized trainers. In addition, we had a presentation by Underwriters Laboratories about determining the certification status of electrical products and the use of the new [Product Spec](#) application. I would like to thank Phil Lou, Solar Energy Specialist with [Washington State University](#) extension energy program; Bill Hoffer and Brian Mehalic with [Solar Energy International](#); and Jeff Fitzloff with [Underwriters Laboratories](#) for providing great training for our inspectors.

We continue to pursue the Underground Economy in our efforts to maintain a level playing field for properly licensed electrical contractors and certified electricians. Our inspectors continue to find unlicensed electrical contractors using uncertified workers making substandard installations without permits and inspections. You can join our effort by reporting violators. Information about how to make a referral is found on the [Violators](#) page of our website.

## Telecommunications Workers Grandfathering Opportunity Ending in Less Than 6 Months

Technology is bringing many changes, installation materials and methods for some limited energy systems are now much like those used by the telecommunications industry. Do you or someone you know have unsupervised telecommunications experience gained while working for a licensed (01) general or (06) limited energy electrical contractor in Washington? For a very limited time, the legislature is allowing an opportunity to apply that valuable work experience towards eligibility for the (06) limited energy systems specialty certification examination.

Want more information?

- Please review the [May 2014 Electrical Currents](#) newsletter for eligibility requirements and the two methods that can be used to document your past work experience.

What do I do next?

- If eligible, complete the [special affidavit form](#); it must be received before July 1, 2015 by mail as instructed on the top right of the form. Please do not attempt to return the form to an L&I service location as it may cause a delay in processing.

## Safety Tip of the Month

Portable generators are useful during power outages and on construction sites. Be aware of the dangers of improper use of portable generators. One of the most common dangers associated with portable generators is carbon monoxide poisoning. Make sure your generator is in a well-ventilated outdoor area. Never use a generator in an attached garage, even with the door open.

Place generators so that exhaust fumes will not enter the building through windows, doors, or other openings.

You can download a helpful generator safety publication from the National Fire Protection Association [here](#).

- The July 1, 2015 deadline only applies to submitting hours of unsupervised telecommunication experience for consideration. Once hours are credited toward qualifying for examination, you never lose those hours. This deadline does not apply to applying for or passing the (06) limited energy specialty examination. To be eligible to take the (06) limited energy specialty examination, applicants must have a minimum of 4000 hours of qualified work experience.

So far, the department has received 125 special affidavit forms. This opportunity began on June 12, 2014; all applications must be received before July 1, 2015. After that date, our legal authority to consider unsupervised telecommunications experience expires.

This one-time opportunity ends in less than 6 months. Do not miss out!

## Grounded Circuit Conductor at Switch Locations Controlling Lighting Loads

With the adoption of the 2014 NEC® came a requirement in 404.2(C) to install a grounded circuit conductor (neutral) at all switch locations that control lighting loads unless the wiring is installed in a raceway or the construction of the building allows for the ready installation of a grounded circuit conductor in the future.

Often, lighting systems in new buildings are controlled by occupancy sensors connected to proper wiring. In other buildings undergoing a lighting control upgrade, occupancy sensors are being added in existing switch boxes where no grounded conductor exists. When this happens, the installer typically utilizes the equipment-grounding conductor as the standby current return path, which creates a potentially unsafe circulating current on it and any non-current-carrying metal parts in contact with it. The new requirement for grounded circuit conductors at switch locations applies to all installations regardless of occupancy type (residential, commercial, industrial, etc.)

There are seven situations listed in 2014 NEC® 404.2(C) where the grounded conductor may be omitted:

- 1) Where the lighting circuit enters the box through a raceway system with sufficient capacity to install a future grounded circuit conductor with the lighting circuit conductors.
- 2) Where the switch box and a box containing the branch circuit including the grounded conductor of the controlled lighting circuit is accessible for the installation of an additional or replacement cable without removing building finish materials.
- 3) Snap switches with integral enclosures supplied by non-metallic sheathed cable.
- 4) Where a switch does not serve a habitable room or bathroom, (some examples of non-habitable rooms include hallways, stairways, garages, and storage or equipment spaces).
- 5) Where multiple switches control the same lighting load, a grounded conductor of the controlled lighting circuit must be installed at one or more switch location(s) such that the entire floor area covered by that lighting load is visible from the single or combined switch locations.
- 6) Where the lighting is controlled by automatic means.
- 7) Where a switch controls a receptacle load.

Some of the wording in these exceptions differs from the text of the NEC®. The above represents Washington's interpretation of the intent of the article.

**Ugly Picture:** Click on the picture to open a larger image. One of our inspectors took this photo while inspecting a service change performed by a homeowner. If you look closely, you will see some very creative and dangerous wiring. The correction notice issued by the inspector resulted in the replacement of this installation with a new code-compliant service panel with proper overcurrent protection.

**Answer to Question of the Month:** NEC® 430.52(C) – 25 amperes. The full-load current of the motor is 10 amperes (Table 430.248) multiplied by the percentage of motor full load current for an inverse time circuit breaker (250% from NEC Table 430.52) which equals 25 amperes. Since 25 amperes is a standard size, no increase in size is permitted.



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