

2011 National Electrical Code® Questions & Answers

1. Will the replacement of a residential panelboard be considered a “circuit modification” and prompt the new requirement in 210.12 for AFCI protection of existing branch circuits?

201.12(B) Branch Circuit Extensions or Modifications — Dwelling Units. In any of the areas specified in 210.12(A), where branch-circuit wiring is modified, replaced, or extended, the branch circuit shall be protected by one of the following:

- (1) A listed combination-type AFCI located at the origin of the branch circuit
- (2) A listed outlet branch-circuit type AFCI located at the first receptacle outlet of the existing branch circuit

This change requires a branch circuit to have combination-type AFCI protection when there is an extension or modification. “Branch circuit” is defined in Article 100 as “The circuit conductors between the final overcurrent device protecting the circuit and the outlet(s).” The overcurrent device is not part of the branch circuit and replacing the circuit breaker is not a modification of the branch circuit.

Answer: When the conductors of an existing branch circuit are disconnected from an overcurrent device in an existing panelboard and simply re-terminated on a new overcurrent device in a new panelboard, the branch circuit wiring has not been modified or extended, therefore AFCI protection would not be required.

The US Consumer Product Safety Commission, CCPC, states “Although the requirement is limited to certain circuits in new residential construction, AFCIs should be considered for added protection in other circuits and for existing homes, as well. Older homes with aging and deteriorating wiring systems can especially benefit from the added protection of AFCIs. AFCIs should also be considered whenever adding or upgrading a panel box while using existing branch circuit conductors.”

2. When existing branch circuit serving an area within in a dwelling that requires AFCI protection is extended will the Department enforce the requirement for AFCI, even though the outlet-type AFCI device is not available?

(B) Branch Circuit Extensions or Modifications — Dwelling Units. In any of the areas specified in 210.12(A), where branch-circuit wiring is modified, replaced, or extended, the branch circuit shall be protected by one of the following:

- (1) A listed combination-type AFCI located at the origin of the branch circuit
- (2) A listed outlet branch-circuit type AFCI located at the first receptacle outlet of the existing branch circuit

Since a listed outlet branch-circuit AFCI device is still not available, the Department is looking to Section **90.4 Enforcement**, which allows the authority having jurisdiction to permit compliance with the most recent previous edition of this Code adopted by the jurisdiction.

Answer: Where knob-and-tube wiring or other older distribution systems are encountered, providing AFCI protection presents a significant challenge. Until such time as the outlet-type AFCI device is listed and commercially available, where compliance with 210.12(B) in the 2011 NEC is impracticable, compliance with 210.12 in the 2008 NEC is acceptable.

This should not be considered wholesale authorization to disregard the AFCI provisions, but when compliance is determined to be impracticable (meaning 'not capable of being put into practice') the above alternative will be accepted.

3. The new second sentence of 210.8 states that a GFCI device must be installed in a readily accessible location. How can this requirement be enforced when most installations have no furniture or equipment installed at the time of inspection?

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel. Ground-fault circuit-interruption for personnel shall be provided as required in 210.8(A) through (C). The ground-fault circuit-interrupter shall be installed in a readily accessible location.

When the NEC term “readily accessible” is applied to a piece of electrical equipment that means it’s reachable without having to overcome obstacles. The intent here was to eliminate placing GFCI receptacle devices in unreachable places, e. g. behind a vending machine where resetting the device becomes inconvenient or inside a detached garage without a personnel door, where resetting a GFCI inside becomes impossible.

Answer: Communication with the installer at or before a rough-in inspection regarding the location of the GFCI - receptacle, circuit breaker or dead front device - is essential to help avoid costly mistakes. However, an inspection can only verify that an installation is compliant at that point in time. There is no way to control whether equipment or material may be situated in front of a GFCI device at some point in the future.

4. New section 404.2 applies to the wiring “at the switch location” in all occupancy types. When installing Type NM cable for single-pole, three-way and four-way switches will the grounded circuit conductor associated with the ungrounded conductor for the switch be required at each switch location?

(C) Switches Controlling Lighting Loads. Where switches control lighting loads supplied by a grounded general purpose branch circuit, the grounded circuit conductor for the controlled lighting circuit shall be provided at the switch location.

Exception: The grounded circuit conductor shall be permitted to be omitted from the switch enclosure where either of the following conditions in (1) or (2) apply:

(1) Conductors for switches controlling lighting loads enter the box through a raceway. The raceway shall have sufficient cross-sectional area to accommodate the extension of the grounded circuit conductor of the lighting circuit to the switch location whether or not the conductors in the raceway are required to be increased in size to comply with 310.15(B)(3)(a).

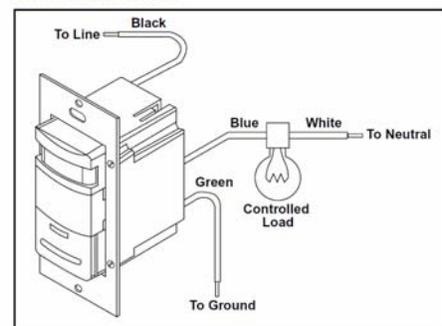
(2) Cable assemblies for switches controlling lighting loads enter the box through a framing cavity that is open at the top or bottom on the same floor level, or through a wall, floor, or ceiling that is unfinished on one side.

Occupancy sensor switches and other types of electronic lighting control devices use a passive infrared motion and heat detection system that does not emit an infrared beam but passively accepts incoming infrared radiation. The electronics in these devices use a very small amount of current to maintain their ability to recognize incoming infrared radiation, which means that both an ungrounded and grounded conductor must be available to provide power.

Previously, a grounded circuit conductor was not required in a box for a switch, so when an occupancy sensing device is used to replace an existing switch, the equipment grounding conductor is often used to complete the standby current circuit.

This is an NEC violation and potentially harmful because it intentionally introduces a very small amount of current onto the equipment grounding conductor and the associated grounded metallic surfaces. UL 101 (ANSI C101-1992) for appliances permits leakage current on the equipment grounding conductor up to 0.5 mA. The current on the equipment grounding conductor in an infrared occupancy sensor circuit is significantly below 0.5 mA. Current on the equipment grounding conductor of a lighting circuit with a single such device would be imperceptible, but increase as more such devices are installed.

Answer: The grounded circuit conductor must be provided at all boxes for single-pole, three-way and four-way switches for lighting control unless the noted exceptions apply. Listed sensing devices that use an EGC in this manner are permitted to be used in accordance with the listing and manufacturer's instructions.



Leviton Sensor ODS-ID

5. Section 404.2 applies to the wiring for switches and exception (2) refers to a framing cavity open at the top or bottom on same floor level. What conditions will be accepted as meeting this?

(2) Cable assemblies for switches controlling lighting loads enter the box through a framing cavity that is open at the top or bottom on the same floor level, or through a wall, floor, or ceiling that is unfinished on one side.

Answer: For the purposes of this section, a wall cavity that remains accessible from an attic, crawl space, basement or other location where the switch box can be accessed without damage to the building finish would meet the allowance in exception #2.

6. Will the Department offer assistance calculating the available fault current calculation required by section 110.24?

110.24 Available Fault Current.

(A) Field Marking. Service equipment in other than dwelling units shall be legibly marked in the field with the maximum available fault current. The field marking(s) shall include the date the fault current calculation was performed and be of sufficient durability to withstand the environment involved.

(B) Modifications. When modifications to the electrical installation occur that affect the maximum available fault current at the service, the maximum available fault current shall be verified or recalculated as necessary to ensure the service equipment ratings are sufficient for the maximum available fault current at the line terminals of the equipment. The required field marking(s) in 110.24(A) shall be adjusted to reflect the new level of maximum available fault current.

One of the most important aspects of electrical system design is assuring that the overcurrent protection is capable of handling the *maximum available fault current*, even though the calculations are difficult and become even more complicated as distribution systems become interconnected. While it is not the responsibility of the inspector to perform that calculation, familiarity with the process is essential to verify that the protection as well as the marking on equipment is appropriate.

The calculation of maximum available fault-current needs to be as accurate as possible.

Answer: Assistance in 1 \emptyset and 3 \emptyset available fault (short-circuit) current calculations can be found at many websites. The Department is not recommending or endorsing any manufacturer, product or site, but the following are links that may be helpful.

http://www.cooperindustries.com/content/dam/public/bussmann/Electrical/Resources/Solution%20Center/technical_library/BUS_Ele_Tech_Lib_Short_Circuit_Current_Calculations.pdf

<http://www.bussmann.com/library/indcon/System%20available%20fault%20currents.pdf>

http://www.electricianmath.com/advanced/short_circuit_current.htm

http://www.mikeholt.com/documents/calculations/formulas/Fault_V7.1.xls

7. What kind of alterations or modifications will require an existing service to be labeled with the maximum available fault current?

Answer: Whenever a change in the electrical distribution system could result in a change in the available fault current, the re-marking requirement applies. This could include a change of use from retail to manufacturing, an addition to or reconfiguration of the service, the addition of significant loads or a change in the size of the utility transformer.

8. Changes were made to 210.5(C) which requires identification of ungrounded conductors in buildings with more than one nominal voltage system. Do the branch circuits have to be identified by phase or line and system at each device and every luminaire?

210.5(C) Identification of Ungrounded Conductors. Ungrounded conductors shall be identified in accordance with 210.5(C)(1), (2), and (3).

(1) Application. Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and system at all termination, connection, and splice points.

(2) Means of Identification. The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means.

(3) Posting of Identification Means. The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment.

There was no change to the existing requirements but the new format breaking paragraph (C) into 3 subsections makes the identification and marking requirements for ungrounded conductors easier to find, understand and enforce.

Note this is not the same requirement found in 200.6(D) for identifying the grounded circuit conductors when there is more than one nominal voltage system, as this requirements applies whether or not the conductors share an enclosure, cabinet or raceway.

Also, this applies to all circuits - not just multi-wire circuits - when a premises has more than one nominal voltage. In addition, similar to 200.6(D) this section requires the identification system to be permanently posted at each panelboard or disconnect.

Answer: At a building with more than one nominal voltage, clearly identifying all circuits phase and system is required at all termination, connection and splice points, including at devices and luminaires.

9. Section 514.11 was changed to require the simultaneous disconnection of each circuit leading to or through a motor fuel dispenser, including communication, data and video circuits. Many gas pumps now have video (coax) as well as the communication wiring for the intercom and a data circuit for point-of-sale card reader. How will this be enforced?

514.11(A) General. Each circuit leading to or through dispensing equipment, including all associated power, communications, data, and video circuits, and equipment for remote pumping systems, shall be provided with a clearly identified and readily accessible switch or other approved means, located remote from the dispensing devices, to disconnect simultaneously from the source of supply, all conductors of the circuits, including the grounded conductor, if any.

Gas stations today dispense three or more types of fuel from multi-product dispensers. Each product is controlled by an individual relay that activates that particular pump motor and many dispensers now have point-of-sale, intercom, data and video circuits. Whether the disconnecting means is the emergency shut-off, readily accessible and located within 100-feet or the maintenance disconnect switch, which is permitted to be located elsewhere, a potential source of ignition remains in the hazardous (classified) area if only the power to the fuel pump is disconnected.

The purpose of the simultaneous disconnecting requirement is to remove any possibility of remotely starting the fuel pump(s) which could release product and to eliminate incentive energy that could ignite the hazardous atmosphere.

The corresponding standard, NFPA 30A 2009, *Code for Motor Fuel Dispensing Devices Facilities and Repair Garages*, also requires the disconnection of all associated power, control and signal circuits as well as all other electrical equipment in the classified area around the dispenser.

Answer: Installation of new or replacement of existing dispensing units triggers the requirement to simultaneously disconnect the power, communication, data and video circuits.

10. NEC 210.52(I) has a new requirement for receptacles in residential foyers. For enforcement purposes, how will the term “foyer” be defined?

210.52(I) Foyers. Foyers that are not part of a hallway in accordance with 210.52(H) and that have an area that is greater than 5.6 m² (60 ft²) shall have a receptacle(s) located in each wall space 900 mm (3 ft) or more in width and unbroken by doorways, floor-to-ceiling windows, and similar openings.

As used in this section, a “foyer” is an area larger than 60 sq ft that is not a room (defined by building code as at least 70 sq ft) and also is wider than a hallway, which must be at least 36” wide.

A hallway and a foyer are different configurations. For a 60 sq ft area to be considered a hallway, it would be 3-feet wide and 20-feet long, whereas a 60 sq ft area foyer can be almost any arrangement of wall spaces and doorways that do not make up a room.

A foyer can be found at an entryway or at the top, midsection or bottom of a stairway, and often have furniture which does not substantially reduce the passageway function. The receptacles in these areas are used for portable lighting and incidental purposes such as illuminated holiday decorations.

Answer: These new receptacle locations apply to areas that can be defined as foyers. Early recognition of the intended use of uncertain spaces will help installers with the application of these additional requirements.

11. A new section 406.14 expands the tamper resistant receptacle requirement to include child care facilities and added a new definition in 406.2. The definition is quite sweeping and would seem to include elementary schools, churches, museums, zoos, etc. where a young child could be present while supervised. How will this be decided?

406.14 In all child care facilities, all non-locking-type, 125-volt, 15- and 20- ampere receptacles shall be listed tamper-resistant receptacles.

Child Care Facility. A building or structure, or portion thereof, for educational, supervisory, or personal care services for more than four children 7 years old or less.

Currently, tamper resistant receptacles are required in dwellings, hotel rooms and designated pediatric locations in health care facilities. The intention of this change was to provide the same level of protection for young children in those other areas where they are normally present for extended periods.

Answer: TR receptacles are required in some school rooms, children's classrooms in churches, kid-care areas at day spas, designated play areas at dental clinics and other locations where four or more children may be supervised.

12. Section 334.10 has been revised and now specifically allows type NM, NMC and NMS cables in attached and detached garages and storage buildings of one-and two- family dwellings. Does this mean that type NM, NMC and NMS cables in other dwelling associated structures not listed - such as a gazebo or child's playhouse – must have the 15-minute finish rating?

334.10 Uses Permitted.

Type NM, type NMC, and type NMS cables shall be permitted to be used in the following:

- (1) One- and two-family dwellings and their attached or detached garages, and their storage buildings.
- (3) Other structures permitted to be of Types III, IV, and V construction except as prohibited in 334.12. Cables shall be concealed within walls, floors, or ceilings

that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

Although not specifically included in the list of acceptable locations, Type NM, NMC and NMS cables in structures normally associated with one-and two- family dwellings are not required to be concealed within walls, floors and ceilings that provide a thermal barrier of material that has a 15-minute finish rating.

Answer: Type NM cable is permitted to be installed without a 15-minute finish rating in garages, storage buildings and other structures normally associated with one-and two- family dwellings.

NOTE: Type NM cable is also permitted to be installed without a 15-minute finish rating in garages and storage buildings constructed on residential or recreational property prior to the actual construction of the dwelling.

13. What are the affects of the change that was made to Exception No. 3 in NEC 230.40?

230.40 Number of Service-Entrance Conductor Sets.

Each service drop, set of overhead service conductors, set of underground service conductors, or service lateral shall supply only one set of service-entrance conductors.

Exception No. 3: A single-family dwelling unit and its accessory structures shall be permitted to have one set of service-entrance conductors run to each from a single service drop, set of overhead service conductors, set of underground service conductors, or service lateral.

When 230.40 Exception No. 3 first appeared in the 1996 NEC, the intent behind the code change was to allow one set of service-entrance conductors to be run from a common location on one building, such as a wireway or meter-socket enclosure(s) to a detached garage or shop. The service drop or lateral would be permitted to be run to either building, the service conductors would remain outside the buildings, the service disconnecting means for each set of service-entrance conductors would be located to comply with 230.70 (nearest the point of entrance), and each building would have its own service disconnecting means.

The substantiation for the change was to negate the cost of replacing the existing 100 ampere service panel in a dwelling if it did not have adequate capacity to supply a detached garage or shop. This proposal was seriously short-sighted because it was attempting to resolve a problem that could have been resolved with any number of different code-compliant electrical configurations, and unfortunately the proposal was accepted by the code panel without much scrutiny and absolutely no challenge or participation from the greater electrical industry. Presumably to avoid confusion, some states have amended this exception out of code when they have adopted the NEC.

Under the 2008 and earlier editions of the code, NEC 230.40 Exception No. 3 stated in part that "A single family dwelling unit and a separate structure shall...", in effect limiting the allowance to a single detached building. The 2011 NEC was changed to read in part that "A single family

dwelling unit and its accessory structures shall...", in effect removing the limitation on the number of buildings that could be supplied as outlined above.

NEC 230.40 Exception No. 3 has been misinterpreted to require that service equipment be installed at a common distribution point on a residential premises if more than two buildings are supplied, and that service equipment be installed at a common distribution point on a non-residential premises if more than one building is supplied. This is not correct and it was not the intent of NEC 230.40 Exception No. 3 when it was introduced into the NEC in 1996.

It's important to recognize the following fundamental electrical code concepts:

- Article 100 in the NEC has several definitions related to services.
- Every occurrence of the word "building" in the various service definitions is in the singular form, not the plural form.
- The NEC does not regulate the number of buildings on a premises.
- The NEC does not regulate the number of utility-supplied metered services on a multi-building premises. In other words, on a multi-building premises, a separate utility-metered service could be installed to each building - this may not be very practical or economically feasible if the buildings are in close proximity to one another, but it is not regulated by the NEC.
- In part, Article 225 contains rules for outside branch circuits and feeders run on or between buildings, structures, or poles (unlike service conductors, branch circuits and feeders are provided with short-circuit and ground-fault protection at their supply end.)
- Article 230 in the NEC contains rules for service conductors and equipment for control and protection of utility-supplied services and their installation requirements.
- Unlike branch circuits and feeders, service conductors do not have short-circuit and ground-fault protection at their supply end (service conductors are provided with "overload" protection at their load end.)
- Various rules in the NEC are in place to ensure that service conductors that are subjected to a catastrophic overcurrent event do not, in theory, compromise the safety of the building to which they are connected or attached. Ideally, service conductors subjected to a catastrophic event would burn clear of the building.
- As an absolute minimum, the first occurrence of disconnection and overload protection for service conductors is inside the building nearest the point of entrance of the service conductors (the allowable length of service conductors inside a building will vary from job to job, but they shall always be kept to an absolute minimum). In some cases the disconnecting means and overload protection may be upstream from this inside location (e.g. installed on the exterior wall of the building.)
- Where the service equipment is located outside on the exterior of the building, there may not be any service-entrance conductors, or they may be entirely outside the building.
- Notwithstanding other rules in the NEC (e.g. rules in Article 547 that establish a common distribution point on a multi-building agricultural premises), there is no limit to the

quantity of “un-fused” conductors that can be installed outside of a building on a premises, or outside of more than one building on a multi-building premises.

- Notwithstanding any applicable exceptions, the basic rule in 230.2 is that a building shall be supplied by only one service drop, one set of overhead service conductors, one service lateral, or one set of underground service conductors.
- Notwithstanding any applicable exceptions, the basic rule in 230.40 is that one service drop, one set of overhead service conductors, one service lateral, or one set of underground service conductors shall supply only one set of service-entrance conductors.
- Service conductors that supply a building or other structure shall not pass through the interior of another building or structure (230.3). In other words, if a service supplies more than one building on a multi-building premises, the service conductors are permitted to be installed on the exterior of Building A in order to supply a service in Building B, but they are not permitted to pass through the interior of Building A to get to Building B.
- Service conductors and service-entrance conductors are permitted to be spliced in accordance with various rules in the NEC. The definition of a run of service conductors does not necessarily and automatically change simply because the run of conductor is interrupted by a terminal box, enclosure, metering equipment, pole, pedestal, or splice.
- On the contrary, a defined set of underground service conductors may automatically become defined as a set of service-entrance conductors where the underground conductors penetrate the basement wall of a building (where there is no terminal box, meter, or other enclosure). The point of connection (or transition) from underground service conductors to service-entrance conductors is the point of entrance of the conductors into the building essentially where the conductors pass through the basement wall.

Answer: Service entrance conductors are permitted to be extended to any number of buildings on a single premise without an overcurrent device at the distribution point.

14. The new 590.4 (D)(2) requires receptacles in wet locations to comply with 406.9(B)(1) which requires the “in-use covers.” Will temporary services be allowed to have the old “flipper” covers after July 1, 2011 or will this only apply to brand new temporary services?

590.4 General.

(D)(2) Receptacles in Wet Locations. All 15- and 20-ampere, 125- and 250-volt receptacles installed in a wet location shall comply with 406.9(B)(1).

406.9(B) Wet Locations.

(1) 15- and 20-Ampere Receptacles in a Wet Location. 15- and 20-ampere, 125- and 250-volt receptacles installed in a wet location shall have an enclosure that is weatherproof whether or not the attachment plug cap is inserted. For other than one- or two-family dwellings, an outlet box hood installed for this purpose shall be listed, and where installed on an enclosure supported from grade as described in 314.23(B) or as described in 314.23(F) shall be identified as “extra-duty.”

Answer: A new installation of a previously installed temporary service must comply with the provisions of the current Code, such as grounding, GFCI protection, and “extra duty” in-use covers on 15- and 20-amp receptacle outlets installed outdoors.

15. Per section 210.8(A)(7) does a receptacle outlet for a flat screen TV located behind a wet bar but within the 6-foot radius of the outside edges of the sink now require GFCI protection?

210.8 Ground-Fault Circuit-Interrupter Protection for Personnel

A) Dwelling Units. All 125-volt, single-phase, 15- and 20-ampere receptacles installed in the locations specified in 210.8(A)(1) through (8) shall have ground-fault circuit-interrupter protection for personnel.

(7) Sinks — located in areas other than kitchens where receptacles are installed within 1.8 m (6 ft) of the outside edge of the sink

There is no exception for receptacles that are located within 6-feet of a sink but are concealed. Similar to other Code requirements, this is a radial measurement and includes the area within a specific distance from a potential hazard, such as the 5-foot minimum distance for pool, spa and hot tub disconnect switches found in Article 680.

Answer: The requirement for GFCI protection includes receptacles installed within 6-feet - in any direction.

16. Section 338.10(B)(4) for Type SE cable now excludes the ampacity adjustment restrictions of 334.80. For individual dwelling unit feeders in multifamily buildings, where the 120/240-Volt single-phase feeder carries 100% of the dwelling unit’s diversified load, is the ampacity determined with the 60°C rating as per 338.10(B)(4) or with Table 310.15(B)(7)?

338.10(B)(4)(a) Interior Installations. In addition to the provisions of this article, type SE service-entrance cable used for interior wiring shall comply with the installation requirements of Part II of Article 334, excluding 334.80.

Where installed in thermal insulation, the ampacity shall be in accordance with the 60°C (140°F) conductor temperature rating. The maximum conductor temperature rating shall be permitted to be used for ampacity adjustment and correction purposes, if the final derated ampacity does not exceed that for a 60°C (140°F) rated conductor.

Informational Note No. 1: See 310.15(A)(3) for temperature limitation of conductors.

Informational Note No. 2: For the installation of main power feeder conductors in dwelling units refer to 310.15(B)(7).

There has been an ongoing conflict and lack of coordination for the ampacity for Type SE cable because 338.10(B)(4) was tied to the requirements for type NM cable in 334.80 as well as the allowances for dwelling services and feeders in Table 310.15(B)(7) - formerly Table 310.15(B)(6).

The new language in 334.10(B)(4) resolves the issue by only requiring type SE cable to comply with ampacity adjustment factors for type NM cable only when it is installed within thermal insulation. Ampacity calculations for both SE cable installed within insulation and type NM cable are permitted to start with the 90°C rating and after adjustments and corrections the ampacity cannot exceed the ampacity rating in the table for 60°C conductors of the same size and material.

Type SE cable with 90°C rated insulation is different than type NM with 90°C conductor insulation. While the individual conductors in type NM cable are required to have an insulation rating of at least 90°C the insulation itself is not a recognized type. The individual conductors of type SE cable are rated 75°C or 90°C and covered with insulation type that is recognized in the NEC®.

Answer: The allowances in Table 310.15(B)(7) for 120/240-volt, 3-wire, single-phase service-entrance conductors, service-lateral conductors, and feeder conductors that serve as the main power feeder individual dwelling units of one-family, two-family, and multifamily dwellings apply to type SE cable when the cable is not installed in thermal insulation.

17. Under the 2011 NEC, will equipment grounding conductors run with feeders to a transformer be allowed to be used as the grounding electrode conductor for the separately derived system if sized correctly?

250.121 Use of Equipment Grounding Conductors. An equipment grounding conductor shall not be used as a grounding electrode conductor.

This was clarified in the 2011 NEC with Proposal Number 5-259 from Phil Simmons. His substantiation was that equipment grounding conductors do not normally carry current, whereas, a grounding electrode conductor may carry current, if it is parallel with the grounded circuit conductor.

Answer: An equipment grounding conductor cannot be used as a grounding electrode conductor.

18. The current Code allows grounding type GFCI receptacles to be used for the replacement of non-grounding type receptacles. After January 1, 2014 the receptacles will also have to be AFCI protected. Will a single or duplex AFCI/GFCI receptacle device be available?

The NEC has been used to provide impetus for the manufacture of a specific safety product before and it happening here, too. The 1999 NEC had AFCI requirements and they have expanded in recent years without any manufacturer producing the device.

While there currently is some ground-fault sensing inherent within the AFCI electronic detection circuitry, it does not act at the 3 to 5 mA level required of GFCI protection.

Answer: Revisions for the 2014 NEC® may alter the requirement or extend the deadline, particularly if some kind of AFCI/GFCI device is not available by early 2013.

19. Table 310.15(B)(7) allows a #2 aluminum cable or conductor to supply a 100 amp service or feeder to supply a dwelling. If a service or feeder is installed to a residential detached garage, can that same #2 aluminum cable or conductor be protected by a 100 amp circuit breaker?

310.15(B)(7) 120/240-Volt, 3-Wire, Single-Phase Dwelling Services and Feeders. ... For individual dwelling units of one-family, two-family, and multifamily dwellings, conductors, as listed in Table 310.15(B)(7), shall be permitted as 120/240-volt, 3-wire, single-phase service-entrance conductors, service-lateral conductors, and feeder conductors that serve as the main power feeder to each dwelling unit and are installed in raceway or cable with or without an equipment grounding conductor.

For application of this section, the main power feeder shall be the feeder between the main disconnect and the panelboard that supplies, either by branch circuits or by feeders, or both, all loads that are part or associated with the dwelling unit.

The language of this section was not changed for the 2011 NEC, although there were many proposals and comments. The panel stated that utility company data showed 120/240-volt, 3-wire, single-phase systems have significant load diversity where 100% of the load is for the dwelling and the application will not be expanded without technical substantiation.

Answer: The overcurrent protection allowances in 310.15(B)(7) apply only to the specific installations identified in that section and do not apply to other feeders or branch circuits at a dwelling or any other occupancy.