Washington State Department of Labor & Industries

Electrical Currents

Newsletter from the Office of the Chief Electrical Inspector

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Question of the Month

Is Arc-Fault Circuit-Interrupter (AFCI) protection required for existing branch circuits when replacing dwelling unit circuit breakers or changing a panel?

Arc-Fault Circuit-Interrupter Requirements

A proposal to align AFCI requirements with the 2014 NEC by removing amended AFCI requirements in WAC 296-46B-210 was adopted during the last rulemaking. Installations made on any electrical work permit purchased after July 1, 2014 are subject to the 2014 NEC AFCI requirements.

One of the most significant changes between the 2008 and 2014 versions of the National Electrical Code installers encounter is the expansion of Arc-Fault Circuit-Interrupter (AFCI) protection in NEC 210.12.

- Dwelling unit AFCI protection has expanded and now includes all 120-volt, single phase, 15- and 20-amp branch circuits supplying outlets or devices installed in dwelling unit kitchens, family rooms, dining rooms, living room, parlors, libraries, dens, bedrooms, sunrooms, recreation rooms, closets, hallways, laundry areas, or similar rooms or areas. This includes hard-wired equipment and appliances.
- Dormitory units now fall under similar requirements.
- Devices providing AFCI protection must be installed in a readily accessible location.

Safety Tip of the Month!

When working on or about energized or potentially energized electrical equipment, be aware that an arc flash/blast event can seriously injure or kill you and anyone nearby.

NFPA 70E-2012, Standard for Electrical Safety in the Workplace, provides assistance in determining the severity of potential exposure, planning safe work practices, and selecting personal protective equipment.

Here is a good ***Arc Flash Awareness*** video from the National Institute for Occupational Safety and Health (NIOSH) that shows what can happen when things go wrong.

Class B Labels – Validating and Posting

Recently, questions have been asked about when Class B random inspection labels must be validated using the department's online system. The Class B labels and the process for their use and validation were updated in March 2013. ***WAC 296-46B-908***(2)(a) describes the process for validating and posting Class B labels purchased after February 28, 2013. The entity doing the electrical work must use the department's online Class B system to enter the jobsite information for an unused label and post the label or label number before beginning the work. If the work occurs on a weekend or a federal/state holiday, the purchaser must still post the label/number before beginning the work, but may enter the jobsite information into the online system no later than the next business day. For additional information about Class B labels, the department has prepared a publication that details ***what you should know about Class B labels.***

Luminaire Ballast Disconnecting Means – Now Required When a Ballast is Replaced

NEC 410.130(G)(1) gives the requirements for installing a disconnecting means for fluorescent luminaires that utilize double-ended lamps and contain ballast(s) that can be serviced in place. This requirement first appeared in the 2005 NEC and did not specify whether a disconnecting means was required when replacing an existing ballast in an existing luminaire. To provide consistency, in ***May 2008*** an *Electrical Currents* newsletter article was published which stated a disconnecting means was not required if the luminaire was installed prior to January 1, 2008.

A change in the 2011 NEC, added a sentence to NEC 410.130(G)(1) stating "*For existing installed luminaires without disconnecting means, at the time a ballast is replaced, a disconnecting means shall be installed.*" Effective August 1,

2014, the department will enforce the current NEC requirement and require ballast disconnecting means as specified in 2014 NEC 410.130(G)(1). This article supersedes the previous *May 2008* article.

NEC 690.47(D) – Additional Electrodes for Photovoltaic Array Grounding

One of the controversial changes in the 2014 NEC is the modified requirement for additional electrodes for photovoltaic array grounding. This requirement first appeared in the 2008 NEC and was deleted from the 2011 edition. For 2014, the requirement was re-instated, but was modified to require additional "auxiliary" electrodes to be installed in accordance with NEC 250.52 and 250.54. Because 250.54 does not require an auxiliary electrode to be bonded to the other electrodes present at a building or structure as part of the grounding electrode system, there could be a difference of potential between the auxiliary electrode, a building electrode system, and grounded metal parts of the building or structure, especially during a lightning event. This difference of potential could cause objectionable current flow on the equipment grounding conductor connected to the frames of the modules as required by 690.43. Equipment in the equipment grounding conductor path would be subject to risk of damage, and create a possible shock hazard for anyone contacting the equipment during a lightning event.

NEC 690.47(D) Exception No. 2 states an additional array grounding electrode(s) shall not be required if located within 6 feet of the premises wiring electrode. Until this problem is addressed in the NEC, Washington State will not require additional electrodes for photovoltaic array grounding if the array is mounted on a building or structure that has a grounding electrode system in accordance with Parts II and III of Article 250.

Grounding of Receptacles and Fixed Electrical Equipment in Patient Care Areas

A change in 2014 NEC 517.2 definitions may have added some confusion to the requirements for grounding of receptacles and fixed electrical equipment in patient care areas required by 517.13. The definition of "*patient care area*" was changed to "*patient care space*". This change was made to align with the definitions in NFPA 99 *Health Care Facilities Code.* The confusion arises because the requirement in NEC 517.13 still refers to "*patient care areas*". The general description of the area or space did not change and refers to "*Space within a health care facility wherein patients are intended to be examined or treated"*. NEC 517.13 requires specific wiring methods for patient care areas (i.e. insulated copper conductor, metal raceway, hospital grade MC, or AC cables, etc.). Patients in these areas may come in contact with ordinary electrical appliances, be connected to electromedical devices, or be subjected to invasive procedures. Not all areas where patients are treated or examined are patient care spaces. The governing body of a facility must designate areas as patient care spaces or not patient care spaces in accordance with the type of patient care anticipated to be provided in the facility.

NEC 517.10(A) was changed to state that Part II of Article 517 (which contains 517.13) shall apply to patient care space of all health care facilities. All locations designated as "*patient care space"* by the governing body of a facility must comply with the requirements of 517.13.

Ugly Installation: Click on the picture to open a larger image. There are too many violations to list in this dangerous installation. The installers may have been sampling the product.

Answer to Question of the Month: Not always. An exception to 2014 NEC 210.12(B) states AFCI protection shall not be required where the extension of the existing conductors is not more than 6 ft. and does not include any additional outlets or devices. This would allow circuit breakers or a panel to be replaced without providing AFCI protection if the conditions in the exception are met. If a circuit is extended more than 6 ft, 2014 NEC 210.12(B) requires AFCI protection where branch-circuit wiring is modified, replaced, or extended in any of the areas specified in 210.12(A).