



● **This Month's Question of the Month** – In straight pulls, the length of the box or conduit must not be less than \_\_\_\_\_ times the trade size of the largest raceway. A) 4, B) 6, C) 8, D) 10 – See the correct answer on page 2.

● **Note From The Chief**

Everyone in our industry knows that things change. As I have stated in previous *Electrical Currents*, the Electrical Program has been implementing LEAN principles that will enable us to identify and eliminate waste and deliver a distinctively better and more consistent quality product for our customers – search previous issues for LEAN at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/WhatsNew/Currents/default.asp>

While we know we are going in the right direction, we still have significant challenges and very hard work ahead of us to prove that we can achieve and sustain greater results. We face these challenges with confidence and momentum that comes from impressive accomplishments. We are investing in a major effort to standardize our inspection and compliance procedures and processes. Our LEAN work will create a more consistent, efficient, and effective product for our customers.

The key to our success will be remaining clearly focused on achieving and sustaining our goals, better inspections, and improved compliance action with the underground economy.

● **Inspection Amnesty**

Use the amnesty opportunity, offered in the January *Electrical Currents*, to clean up your expired permits without inspections, avoid penalties, and ensure you have a safe installation. Amnesty from compliance action as described in the previous article ends February 15<sup>th</sup>. After that date, the Department will begin searching our records to find any remaining permits without inspection and will take compliance action on all identified permits with inspection request violations.

● **DEF Dispenser Equipment**

New federal laws are requiring the installation of Diesel Exhaust Fluid (DEF) dispensers where commercial diesel dispensers are installed. DEF is corrosive, but is not a hazardous substance. Neither NEC 500 nor 514 are applicable to DEF dispensers. DEF dispensers may be a part of a diesel dispenser or be a separate dispenser.

A new electrical standard, UL 87C, has been developed for DEF dispensers. As with many new products and standards, the DEF manufacturing industry needs additional time to get their equipment listed. L&I inspectors will not require listing or field evaluation of DEF dispensers until August 1, 2012. Until August 1<sup>st</sup>, L&I inspectors will inspect the dispensers to WAC 296-46B and the NEC requirements as an electrical installation and will not issue a correction for the lack of a testing laboratory listing.

● **Electrical Board Vacancies – Applications Due Before March 1, 2012.**

Do not forget to make application for the currently and upcoming vacant Electrical Board positions. This is a great opportunity for you to be a voice for your industry. The Electrical Board has one current vacancy, a telecommunication utility representative, and three positions that expire July 7, 2012. The expiring positions are:

- Electrical utility representative
- Telecommunications contractor
- Building official from a city or town with an electrical inspection program

For more information, see the December 2011, *Electrical Currents* at

<http://www.lni.wa.gov/TradesLicensing/Electrical/files/currents/elc1112.pdf>.

**Safety Tip of the Month!**

Look inside your light fixture. Find the label that tells you which light bulb size (wattage) and type is right your fixture.

All electrical cords should be in good condition – no breaks, exposed conductors, or crush points.

● **Stakeholder Meetings**

In February, stakeholder meetings will be held at four locations. We look forward to this opportunity to communicate with our customers. It is important for you to stay up to date with changes that might affect you. Attending stakeholder meetings gives you an opportunity to get your questions answered and give us your input. All meetings are from 6:30 p.m. to 8:30 p.m. The locations are:

|  |  |
|--|--|
| <b>February 7<sup>th</sup> – Vancouver</b><br>Labor and Industries, 312 SE Stonemill Dr Suite 120        | <b>February 8<sup>th</sup> – Tumwater</b><br>L&I Auditorium, 7273 Linderson Way SW                       |
| <b>February 21<sup>st</sup> – Port Angeles</b> – Elwha Klallam Tribe Heritage Center, 401 E First Street | <b>February 22<sup>nd</sup> – Tacoma</b> - L&I Building, 950 Broadway, Orcas Room, 5 <sup>th</sup> floor |

● **Temporary Plug and Cord Wiring – Carnivals, Fairs, Concerts, Trade Shows and Similar Events**

Due to recent questions, we are revisiting and clarifying a newsletter article printed in September 2008. Wiring a temporary power distribution system, using plug and cord wiring methods, is not exempt work even if the power source is from a permanently installed electrical receptacle. A permit and inspection is required for any type of temporary power distribution system that uses generators, dimmers, transformers, feeders, branch circuits, or other means that distribute power to electrical equipment (e.g. amplifiers, lights, etc.). A distribution system means the interconnecting wiring, spider boxes, or other equipment that is installed to distribute power to the end user (e.g. booth operator, vender, etc.) for plugging in their equipment.

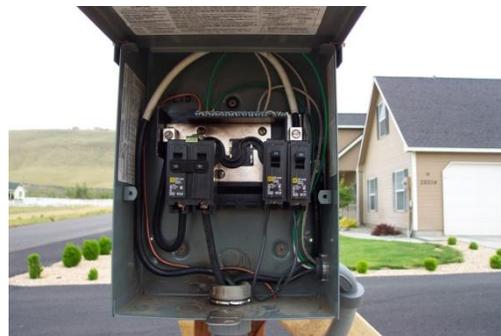
If the plug and cord system and all of the equipment it supplies are owned by the installer (e.g. show operator, road crew, etc.), the installer is considered to be an owner and is exempted from the requirements for electrical contractor licensing and certification by RCW 19.28.261(1) so long as: the installer has approval from the property owner to make the electrical installation and there is no hard wiring involved in the system. When these conditions are met, the plug and cord electrical distribution system is the “place of business” for the system/equipment owner or firm. Firms that install temporary power wiring including plug and cord systems to other end users are required to be properly licensed electrical contractors.

● **Correction – WAC Rule Update**

The January 2012 *Electrical Currents* newsletter incorrectly stated that the department has filed a CR101 pre-proposal statement of inquiry to begin rule making for WAC 296-46B. The CR101 statement will be filed in August or September of 2012. Look for more information on the WAC rule revision process in a special edition *Electrical Currents* newsletter in March.

● **Ugly Installations**

To enlarge the picture, Rclick on the picture, select Copy, and Paste into a MSWord document. Then, you can LClick on the picture, place your cursor over the picture’s corner until a ↕ symbol appears and then hold the LClick button and drag your mouse to expand the picture.



Violations: NEC 230.74 – each service disconnect shall simultaneously disconnect all ungrounded service conductors, NEC 110.7 – wiring integrity, free from short circuits.

● **Answer to This Month’s Question of the Month: C)8 – 2008 NEC 314.28(A)(1)**



● **This Month's Question of the Month** – No transformer may be installed in a location where dust with \_\_\_\_\_ characteristics may be present. – *See the correct answer on page 2.*

● **Note From The Chief – Amnesty Offer**

We continue to see a significant number of permits purchased and the work completed or energized with no inspection request. Electrical permits expire 12 months after the purchase date if there is no inspection request. Refunds are not available for an expired electrical permit. If electrical work was performed and the permit expired without an inspection request, a new permit must be purchased and an inspection request made.

3,000 permits purchased from January 1, 2009, through December 31, 2010, were not requested for inspection and have expired. 3,800 additional permits purchased from January 1, 2010, through August 31, 2011, have had no inspection request. Permit holders are required by WAC 296-46B-901(10)(a) to make inspection requests within:

- 3 business days after completing the installation; or
- 1 business day after energizing circuits or equipment, whichever comes first.

In an effort to ensure safe electrical installations were made on these permits, I am offering amnesty from any compliance action for any electrical contractor that purchased an electrical permit:

- Since January 1, 2009, and is expired, and failed to request an inspection of the electrical work on that expired permit. To qualify for the amnesty, the contractor must:
  - Obtain a new permit and request inspection for the work before February 15, 2012, and
  - Ensure the local supervisor is aware that the new permit is replacing an expired permit when making the request for inspection on the new permit. Do this by entering "Replaces expired permit # \_\_\_\_\_" as well as a description of the work in the Description of Work field when obtaining the new permit and again in the Comments field when making the inspection request online.
- Since January 1, 2010, for active permits where the holder failed to request an inspection of the electrical work on that permit within 3 business days after completing the installation or within 1 business day after energizing circuits or equipment, whichever comes first. To qualify for the amnesty, the contractor must request the inspection before February 15, 2012.

On a monthly basis beginning in February 2012, we will:

- Send out a "no inspection request" warning letter approximately 90 days after a permit purchase where there has been no inspection request made.
- Review our records to find expired permits without an inspection request.
- The department will take compliance action on all identified permits with inspection request violations.

Use this amnesty opportunity to clean up your expired permits without inspections, avoid penalties, and ensure an electrically safe installation was completed for your customers. You can view your permit history and identify any permits without an inspection request by logging into your Secure Access Washington (SAW) internet account. If you have any questions about how to review your permits, call Elissa Zyski at (360) 902-5906 or Phyllis Cooper at (360) 902-5293.

● **WAC Rule Update**

The department has filed a CR101 notice of intent to begin rule making for WAC 296-46B. I will publish a special edition *Electrical Currents* newsletter in March. It will contain complete information about the rulemaking timeline, Technical Advisory Committee, proposals, etc. Do not put your name in for the TAC prior to reading the special edition. Governor Gregoire has extended the moratorium on new rule making for rules considered non-critical. Rule making proposals will be considered non-critical unless:

- Required by law or court order;
- Necessary to manage budget shortfalls or maintain fund solvency;

**Safety Tip of the Month!**

Never pull a cable to release a plug from the wall. It might take longer to cross the room, but stay safe by ensuring that you hold the plug, not just the cable, as you pull it out of the wall.

- Necessary to protect public health, safety, and welfare;
- Beneficial to or requested by and supported by the regulated entities or small businesses that it affects; or
- Necessary to respond to current economic conditions or assist in long-term recovery, to include employment assistance, consumer protection, or government reform.

### ● Electrical Board Vacancies – Applications Due Before March 1, 2012.

Do not forget to make application for the currently and upcoming vacant Electrical Board positions. This is a great opportunity for you to be a voice for your industry. For more information, see the December 2011, *Electrical Currents* at <http://www.lni.wa.gov/TradesLicensing/Electrical/files/currents/elc1112.pdf>.

### ● When The General Contractor Doesn't Completely Finish The Walls

It is common today for the general contractor to leave unfinished spaces for the owner to complete after moving in. L&I electrical inspectors will not provide a fully completed final approval when this occurs. If the wiring is code compliant, complete, and all devices are in place, the inspector will mark the final inspection "approved partial" and will enter a comment that specific spaces are unfinished. If a final "approved complete" notice is needed by the owner after the finish is completed – drywall, etc.:

- The original electrical contractor must pay a progress inspection fee on the original permit and request a final inspection; or
- The owner may obtain a safety inspection permit and request the inspection.

When spaces are left unfinished, wiring is left exposed before the final finish material is installed. Ground and arc fault protection devices will only be required as necessary to protect the circuits as intended after the installation of the final finish. In spaces intended for occupancy (i.e. not garages, shops, and similar spaces) that will be later finished, exposed wiring will not be required to have physical protection beyond what is required for a rough-in inspection where the space will be finished later (e.g. no running boards, etc.), but final inspection approval will not be given. Physical protection will be required for garages, shops, and similar spaces.

### ● Focused Compliance

L&I inspectors are focusing their compliance efforts on the underground economy and contractors who fail to obtain electrical permits and inspection in an attempt to gain a competitive advantage over other contractors. By focusing our compliance efforts on unlicensed electrical contractors, uncertified electricians, and anyone who does not obtain an electrical permit and inspection, we will address our customers' expectations regarding compliance enforcement in the underground economy and helping maintain a level competitive playing field.

You must be a licensed electrical contractor if you advertise, bid, or are otherwise in the business of installing, repairing, or maintaining electrical wiring or equipment. Being a certified electrician does not allow a person to be an electrical contractor. Penalties for a violation of the electrical contractor law begin at \$500. For more information on becoming a licensed electrical contractor, go to:

<http://www.lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/default.asp>

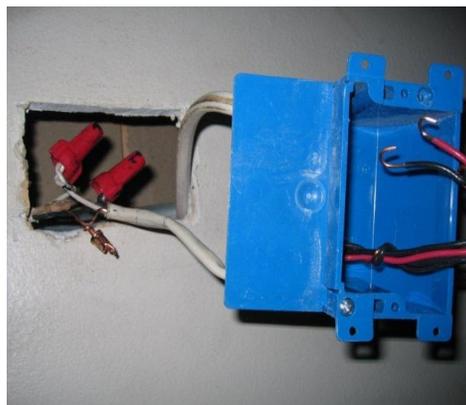
Electrical contractors should routinely check that their electricians' and trainees' electrical certificates are active and valid for the scope of work they are doing.

If you do not get an electrical permit and electrical inspection for your work, you place your customers and the public at risk and are competing unfairly.

### ● Ugly Installations

Violations: NEC 110.3(B) – improper equipment ground crimp, NEC 300.15 – splice without a box, WAC 296-46B-990(3)(h) – serious noncompliant installation

### ● Answer to This Month's Question of the Month: hazardous – 2008 NEC 502.100(3)





● **This Month's Question of the Month** – The minimum number of 120-volt, 20-ampere, 2-wire lighting branch circuits required for a residence that measures 50 feet by 30 feet is \_\_\_\_\_. A) 2, B) 3, C) 4, D) 5 – See the correct answer on page 2.

● **Note From The Chief**

As I discussed in the May 2011, *Electrical Currents*, the Electrical Program has embarked on a long-term plan to become even more efficient and effective. The initial project with the Tukwila and Everett inspectors has ended. They were successful in developing new standard work practices that were presented to all L&I inspectors at their November 30<sup>th</sup> training. Both offices have proven that LEAN principles work. Both offices have improved their inspection response time (now about 98% <48 hours) and compliance enforcement focused on unlicensed electrical contractors, uncertified electricians, and entities that do not get permits and inspections. I want to offer my sincere thanks to both offices for their hard work and to everyone who supported them during this very successful project.

They used the Toyota Production System's LEAN process to eliminate waste and standardize our processes. As I said in the May newsletter, LEAN is a set of concepts, principles, and tools used to create and deliver the most value while consuming the fewest resources while engaging all program staff in a continuous improvement effort.

LEAN addresses problems at the systems level and within individual processes. Customer needs define value for the process. LEAN distinguishes steps that create value from those that do not. It reduces waste and builds in quality using LEAN's systematic problem solving methods. Using LEAN principles helps us to repeat and implement successes on a statewide basis.

The project team's work is being implemented across the state. You will see better and more consistent overall service and a reduction in the negative impacts of the underground economy. As I said in May, we will continue to challenge ourselves to provide a better product with less waste.

● **Why Study The 2011 NEC?**

Electricians and administrators are required to have twenty-four hours of continuing education in order to renew their certificates. At least eight of those hours must be NEC update training. Several years ago, the electrical program rules changed to allow credit for NEC update training covering the currently adopted NEC (currently the 2008 printing) or the most recently published version (2011). At this time, anyone seeking electrical certificate renewal may use a 2008 or a 2011 NEC updates class to satisfy their renewal requirement for code update. After the NFPA publishes the 2014 NEC, 2014 NEC update classes will also be approved.

Even though Washington did not adopt the 2011 NEC, it is important for electricians and administrators to remember that the NFPA made changes to the 2011 NEC that will affect them when the 2014 NEC is adopted in Washington. The changes made in the 2011 NEC will not be marked in the 2014 NEC. If you do not review and understand the 2011 changes, you may not be aware of changes that will affect you when Washington adopts the 2014 NEC. You should study the changes made in both the 2008 and 2011 versions.

● **Electrical Board Vacancies – Applications Due Before March 1, 2012.**

The Electrical Board advised the Director on all matters pertaining to the enforcement of the electrical and telecommunications law. The board normally meets once each quarter – the last Thursday in January, April, July, and October.

**Safety Tip of the Month!**

The presence and accumulation of combustible dust is a serious hazard. Keep your workplace clean and use wiring methods appropriate to the potential explosive hazards.

There were at least six deaths from dust explosions and a fatality or injury occurred in 71% of all combustible dust incidents across the USA last year. Between 1980 and 2005, there were 119 workers killed and 718 injured in dust explosions across the nation (US Chemical Safety Board data).

The Electrical Board has one current vacancy, telecommunication utility representative, and three positions that expire July 7, 2012. The expiring positions are:

- Electrical utility representative
- Telecommunications contractor
- Building official from a city or town with an electrical inspection program

The telecommunications utility position’s term will expire on July 7, 2014. All the other positions are four-year terms expiring on July 7, 2016.

The Governor’s office has asked L&I to assist in recruiting applicants for the four positions. Applicants must send their applications and supporting recommendations and supplementary information directly to the Governor’s office. Board information and applications are available on the Governor’s website at:

<http://www.governor.wa.gov/boards/default.asp>. Applicants must use the Governor’s form when applying.

Contact L&I, Crystal Forsberg at (360) 902-5249 if you have questions about the positions or the Electrical Board.

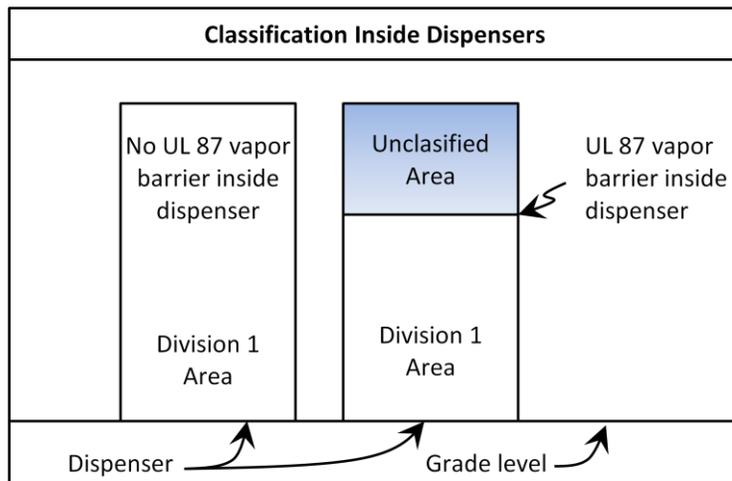
● **Fuel Dispensing Pump – How Is It Classified?**

The question has come up whether the area inside a fuel dispenser is a classified location. 2008 NEC Table 514.3(B)(1) refers to UL 87 as the Standard for classification of areas inside of a fuel dispenser. After reviewing UL 87, it is clear that the answer is, “It depends.” If the dispenser is constructed with a vapor barrier separating the dispenser compartments, the area above the vapor barrier is not a classified area as shown in the drawing below.

In Washington, the 07E equipment repair specialty may perform electrical work on limited “utilization equipment (see RCW 19.28.095 for the complete scope of work). However, for the 07E specialty the equipment must not be in a classified location.

If the dispenser meets the vapor barrier construction requirements of UL 87, the

07E specialty may work inside the unclassified area above the vapor barrier. If there is no vapor barrier, the entire interior of the dispenser is a classified location beyond the allowed work scope of an 07E specialty electrician.



● **Ugly Installations**

This month will begin a series of recent photographs of extremely poor and dangerous electrical installations found by L&I’s inspectors across the state. Please, do not let one of your installations become an Ugly Picture in the *Electrical Currents*.

The first Ugly Picture is an unpermitted and uninspected service panel replacement found by one of our inspectors. Look closely and see how many code violations can you find?



● **Answer to This Month’s Question of the Month:** A) – 2008 NEC 220.12



● **This Month's Question of the Month** – Multiple power sources that may include photovoltaic, wind, micro-hydro generators, engine driven generators, etc., but do not include utility distribution systems or batteries are defined as: A) hybrid systems, B) composite systems, C) mixed systems, D) photo voltaic distribution systems – See the correct answer on page 2.

● **Note From The Chief**

The Governor's Executive Order 11-03 extended the restrictions on rule making to December 31, 2012. I will be seeking an exception to the order that may allow for adoption of the 2014 NEC and adoption of rule proposals that have no significant opposition and benefit the electrical industry.

The Electrical Program will likely begin rule development about April 2012. WAC 296-46B will be opened for proposals and a Technical Advisory Committee will be formed to help review proposals and make recommendations to the department.

If you are interested in being a part of the program's rule making process and receiving other general Electrical Program information, you should join the Electrical Email List at: <http://www.lni.wa.gov/Main/Listservs/Electrical.asp> Additional information will also be published in the *Electrical Currents* newsletter in the coming months.

● **Grounding Electrode Conductor – Protection From Physical Damage**

Inspectors have been encountering grounding electrode installations that are subject to physical damage. NEC 250.64(B) has specific requirements for protection of exposed grounding electrode conductors.

Exposed grounding electrode conductors:

- Smaller than 6 AWG must always have physical protection.
- Sized 6 AWG that are free from exposure to physical damage are permitted to run along the surface of the building construction without protection where it is securely fastened to the building surface.
- Sized 4 AWG or larger must be protected where exposed to physical damage. This requirement was changed from "severe" physical damage in the 2005 NEC.

Physical damage is not defined in the NEC. The department's electrical inspectors will consider the grounding electrode conductor to not be exposed to physical damage when:

- The conductor is buried more than 12" deep in the earth outside the building's footprint.
- Encased or covered by 2" of concrete or asphalt.
- The conductor is inside the building footprint and protected by the building's structural elements or when inside and determined, by the inspector, to not be subject to physical damage.
- Enclosed by a metal or nonmetallic raceway or enclosure. The raceway or enclosure must be approved to protect from severe physical damage if it is not protected by appropriate physical barriers from contact with vehicles, lawn mowers, and other equipment that might damage the conductor or enclosure.

If ferrous metal raceways or enclosures are used to protect the conductor, they must be bonded at both ends to the conductor according to the requirements in NEC 250.64(E).

Problems with physical protection may be avoided by using grounding electrodes that do not require supplemental electrodes or where the grounding electrode conductor can be installed solely inside the structure of the building (e.g. concrete-encased electrode, exterior metal underground water pipe with 10' or more of the pipe in direct contact with the earth, etc.).

**Safety Tip of the Month!**

NW rains are coming. When flood waters suddenly inundate a building the damage can be catastrophic. For helpful information go to: <http://www.lni.wa.gov/TradesLicensing/Electrical/BasicElectInstall/NaturalDisasters/default.asp>

## ● Electrical Inspections On Tribal Trust or Fee Land

In simple terms, tribal trust lands are held in trust by the United States government for the use of a tribe. The United States holds the legal title and the tribe holds the beneficial interest. The electrical law does not apply on trust land. Fee lands are held by an owner, whether Indian or non-Indian. It is not uncommon for trust and fee lands to be intermingled with each other.

On tribal fee land, the electrical law applies and L&I will inspect electrical work and enforce licensing compliance as required by the electrical law. You must determine if you are working on fee land. If you are, you and your workers must be appropriately licensed and certified and get the appropriate permits and inspections.

The Electrical Program is often asked to make electrical inspections on tribal trust land. The program will make those inspections if the tribe is in agreement that we do our inspections using our normal methods (i.e. complete inspection of all electrical work – permit, cover, service, feeders, correction repair, etc.). If the tribe does not support having L&I do those activities, we will not inspect any of the electrical work. To not inspect the work behind a service potentially places the program and consumers at risk from possible electrical hazards that are not inspected. Before applying for an electrical permit, check with your tribal representative to determine if your work is on trust land. If the answer is yes, you should ask the tribe's representative to contact your local electrical supervisor with the tribe's approval to inspect.

## ● Placing Pre-manufactured Heat Mats

The placement of pre-manufactured heat mats in tile grout was added to Class A basic electrical work (i.e. work that doesn't require a permit) in a rule change that became effective November 25, 2005. WAC 296-46B-900(8)(b)(iv) says: *"Embedding pre-manufactured heat mats in tile grout where the mat is listed by an approved testing laboratory and comes from the manufacturer with pre-connected lead-in conductors. All listing marks and lead-in conductor labels must be left intact and visible for evaluation and inspection by the installing electrician and the electrical inspector."* The placement of pre-manufactured heat mats is considered a Class A electrical installation.

The mat installer does not have to be a certified electrician or an electrical trainee under supervision to place the pre-manufactured heat mat in tile grout (e.g. a tile setter). However, the connections of the cable leads to the controlling device must be done by a licensed electrical contractor using a certified electrician. An electrical permit and inspection is required for the electrical work. The field installation of single-wire heat cables or any mats that require field-connection of the non-heating leads to the mat is an electrical installation that requires electrical contractor licensing, electrician certification, permitting, and inspection.

## ● You Must Have Your Electrician Certificate On Your Person

Since 2009, all electricians and trainees have been required to have their certificate and a government issued photo identification in their possession at all times when working as an electrician or trainee. All electrical inspectors have the right to ask you to provide both. If you do not comply with the request for identification or do not have them in your possession, you are subject to civil penalties.

## ● When Do You Need To Be A Licensed Electrical Contractor?

You must be a licensed electrical contractor if you advertise, bid – a registered general contractor can also advertise and bid, or are in the business of installing or working on electrical wiring or equipment. Being a certified electrician does not allow a person to be an electrical contractor. Penalties for a violation of the electrical contractor licensing law begin at \$500 per violation. To become an electrical contractor, you must apply to L&I – electrical contractor application, an assigned electrical administrator, and a \$4,000 bond or assignment of savings.

An administrator is responsible to ensure the electrical contractor and the contractor's electricians follow the electrical law's requirements (see RCW 19.28.061(5)) and must be an officer in the company or a full-time supervisory employee. For more information about exams or becoming an electrical contractor or administrator call (360) 902-5269 or go to:

<http://www.lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/LicenseCert/default.asp>

## ● Answer to This Month's Question of the Month: A) – 2008 NEC 690.2

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical>

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● **This Month's Question of the Month** – EMT is not allowed to be used where \_\_\_\_\_. A) subject to severe physical damage during installation, B) connected to aluminum conduit, C) it is the only means of support for a luminaire, D) in a Class 3 area – *See the correct answer on page 2.*

● **Note From The Chief**

The Electrical Program's mission is to "Keep Washington Safe and Working." We do inspections and compliance to help ensure that electrical installers provide an electrically safe place for Washington consumers and workers to live and work and so legitimate electrical contractors do not have to compete with the underground economy. We also work collaboratively and assist our customers in complying with the electrical law using education and communication. The program leads, coordinates, and directs statewide electrical activities that promote uniform electrical installations, worker certification, licensing, and compliance.

We respect our customers and always strive to work with them to provide them the knowledge they need to succeed. It is important that we sometimes let our customers know how we have made a positive impact on their industry. We work hard to provide high quality inspections and compliance enforcement. Some of the tools we use to help our customers include: the *Electrical Currents* newsletter, a great website, electronic technology to buy permits and request inspections, renew licenses and certificates, and face-to-face stakeholder meetings and contractor trainings to educate and inform the people we work with.

We regularly receive positive comments about the customer service we deliver. Here are some of those comments:

- 25 year electrical contractor – "...very happy with the compliance work being done."
- Electrical Administrator – "...appreciate the L&I electrical divisions work on behalf of my personal betterment and that of our trade, as well as the safety of our customers."
- Manager – "...consistently provides an outstanding level of service."
- Owner – "After you explained about the hazards, it makes sense to get a permit... I really do appreciate the information. Rarely have inspectors been so helpful"
- Engineer – "It is so nice to always have someone willing to help and answer questions on the other end of the phone."
- 25+ year electrical contractor – "...was a wealth of knowledge. Thank you for providing this important training to our employees."

● **Getting Credit For Out Of State Specialty Electrician Training Experience**

The Electrical Program regularly gets requests from applicants, with out of state training experience, seeking to qualify for a Washington specialty electrician examination. Applicants must keep in mind that there are no specialty electrician scopes-of-work that are identical from state to state. It is common that the scope in one state will allow work or training credit that is prohibited in another state, even when the name of the specialty is very similar. Candidates must also keep in mind that any experience gained in another state must have been gained in compliance with that state's law. When scopes are different, it is not uncommon for the candidate to only get partial credit for the experience gained in the other state.

**Safety Tip of the Month!**

- Look around you and avoid any close encounter with an overhead utility distribution line. Death or serious injury is the outcome if you get too close to a utility line.

For instance, both Washington and Oregon have “sign” specialty certificates. Oregon rules allow sign apprentices to gain credit for work done inside the contractors shop. Washington rules do not allow for shop credit in any specialty, so sign candidates, with Oregon experience, seeking to qualify for the Washington sign electrician examination cannot receive training credit for their shop time in Oregon. The candidate must document the training received that directly relates to and is allowed by the Washington scope of work. It is up to the candidate to provide verifiable documentation that will support the request for hours when scopes-of-work are different.

● **Stakeholder Meetings**

Stakeholder meetings will begin this month. Check the schedule and do your best to attend a meeting in your area. Attending stakeholder meetings gives you an opportunity to get your questions answered and give the program your input. The program will be conducting stakeholder meetings beginning this fall. Meetings will be held from 6:30 to 8:30 in the following locations:

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|--|---|
| <b>October 4th – Spokane</b> , Labor and Industries, 901 N Monroe Street               | <b>October 18<sup>th</sup> – Mount Vernon</b> , Padilla Bay Interpretive Center, 10441 Bay View-Edison Rd |
| <b>October 5th – Kennewick</b> , Benton PUD Auditorium, 2721 W 10 <sup>th</sup> Avenue | <b>October 19<sup>th</sup> – Everett</b> , Snohomish County PUD Auditorium, 2320 California St            |
| <b>October 6th – Yakima</b> , Pacific Power Auditorium, 500 Keys Road                  | <b>November 2<sup>nd</sup> – Tukwila</b> , Labor and Industries, 12806 Gateway Dr S                       |

● **Sign Grounding and Bonding - Exception**

L&I’s Electrical Inspectors will allow an exception to 2008 NEC 600.7(B)(1). Section (B)(1) was changed in 2008 to say, “Metal parts and equipment of signs and outline lighting shall be bonded together and to the associated transformer or power-supply equipment grounding conductor of the branch circuit or feeder supplying the sign or outline lighting system and shall meet the requirements of 250.90.” The load side wiring of light emitting diode (LED) signs is usually wired with a Class 2 cable that does not provide a bonding path. 2008 NEC 725.2 demonstrates that due to its power limitations, a Class 2 circuit is considered inherently safe from a fire initiation standpoint and provides acceptable protection from electric shock.

The NFPA determined that an exception to that requirement can be made. Remote metal parts of a section sign or outline lighting system only supplied by a remote Class 2 power supply that is listed or is a recognized component in a listed sign or outline lighting is not required to be bonded to an equipment grounding conductor. This exception eliminates a potential conflict between 2008 NEC 600.7(B)(1) and Article 725 and aligns the department’s requirements with those of the NEC.

● **Electrical Board Recruitment – Applications Due Before December 1, 2011**

We have been advertising for applicants to fill the one Electrical Board position– Telecommunications Utility representative, but have received no applications. Filling this position on the Electrical Board is important and will ensure the industry is represented.

The Governor is seeking applicants for this position. Candidates should work for and represent telecommunications utilities in Washington. The term will expire on July 7, 2014.

Applications should be submitted to the Governor. Supporting recommendations and information should also be mailed to the Governor’s office. Board information and applications are available on the Governor’s website at: <http://www.governor.wa.gov/boards/default.asp>

● **Answer to This Month’s Question of the Month: A), B), C), and D) – NEC 358.12**



● **This Month's Question of the Month** - Since Class 3 control circuits permit higher allowable levels of voltage and current, additional \_\_\_\_\_ are specified to provide protection against the electric shock hazard that could be encountered. A) circuits, B) safeguards, C) procedures, D) devices— *See the correct answer on page 2.*

● **Note From The Chief**

Take the Annual Permit test!

Do you run a large operation and employ your own electrical maintenance staff or contract your maintenance to a licensed electrical contractor?

Does your staff or electrical contractor maintain your facility's electrical system – alter new circuits, install new circuits or feeders from existing equipment, retrofit lighting systems? If you answered “yes” to either of those questions, an annual electrical permit could benefit your company.

One annual permit would cover your electrical maintenance and new wiring in your existing facility. You would no longer need to purchase individual permits or arrange individual inspections. Instead, you would have one permit that is valid for a year and regularly scheduled visits from our inspection staff to inspect your work.

To be eligible, the facility must employ full-time electrical maintenance staff or have a yearly maintenance contract with a licensed electrical contractor. An annual permit can be used for retrofit, replacement, maintenance, repair, upgrade, and alterations to electrical systems at a single plant or building location. The annual permit does not include new or increased services or new square footage.

If you are interested in getting an annual permit or have questions about them, contact your local electrical inspection supervisor. Contact information for all L&I offices is available at:

<http://www.lni.wa.gov/Main/ContactInfo/OfficeLocations/default.asp>

● **Electrical Board Recruitment – Applications Due Before September 15, 2011**

One Electrical Board position is vacant – Telecommunications Utility representative. The Governor is seeking applicants for this position. Candidates should work for and represent telecommunications utilities in Washington. The term will expire on July 7, 2014.

Applications should be submitted to the Governor. Supporting recommendations and information should also be mailed to the Governor's office. Board information and applications are available on the Governor's website at: <http://www.governor.wa.gov/boards/default.asp>

● **Stakeholder Meetings**

Because of our limited budget, the Electrical Program has not had formal customer stakeholder meetings across the state in several years. The budget is still very tight, but we cannot afford to lose the opportunity to communicate with our customers. It is important for you to stay up to date with changes that might affect you. Attending stakeholder meetings gives you an opportunity to get your questions

**Safety Tip of the Month!**

- Keep power cords clear of tools during use.
- Suspend power cords over aisles or work areas to eliminate stumbling or tripping hazards.
- Replace open front plugs with dead front plugs. Dead front plugs are sealed and present less danger of shock or short circuit.
- Do not carry electrical tools by the power cord.
- Do not tie power cords in tight knots. Knots can cause short circuits and shocks.

answered and give the program your input. The program will be conducting stakeholder meetings beginning this fall. Meetings will be held from 6:30 to 8:30 in the following locations:

|  |   |
|--|---|
| <b>October 4<sup>th</sup> – Spokane</b><br>Labor and Industries, 901 N Monroe Street                         | <b>November 2<sup>nd</sup> – Tukwila</b><br>Labor and Industries, 12806 Gateway Dr S                            |
| <b>October 5<sup>th</sup> – Kennewick</b><br>Benton PUD Auditorium 2721 W 10th Avenue                        | <b>February 7<sup>th</sup> – Vancouver</b><br>Labor and Industries, 312 SE Stonemill Dr Suite 120               |
| <b>October 6<sup>th</sup> – Yakima</b><br>Pacific Power Auditorium 500 Keys Road                             | <b>February 8<sup>th</sup> – Tumwater</b><br>L&I Auditorium, 7273 Linderson Way SW                              |
| <b>October 18<sup>th</sup> – Mount Vernon – Padilla Bay</b><br>Interpretive Center, 10441 Bay View-Edison Rd | <b>February 21<sup>st</sup> – Port Angeles – Elwha Klallam Tribe</b><br>Heritage Center, 401 E First Street     |
| <b>October 19<sup>th</sup> – Everett – Snohomish County PUD</b><br>Auditorium, 2320 California Street        | <b>February 22<sup>nd</sup> – Tacoma – L&amp;I Building, 950 Broadway,</b><br>Orcas Room, 5 <sup>th</sup> floor |

### ● **Wiring Requirements For Modular Office Furnishings Or Relocatable Wired Partitions**

When manufactured office partitions contain an electrical distribution system (including switches, receptacles, flexible cable assemblies with quick-connect electrical interconnections, or any branch circuit conductors connected to the premises wiring), all work on the electrical devices and conductors must be done by properly certified electricians and licensed electrical contractors.

Uncertified individuals may assemble the panels, work surfaces, cabinets, shelves, and structural elements of the partitions. Owners and their regularly employed staff may work without being certified electricians, but they should be qualified to work on electrical systems.

Except for some limited device replacement – see RCW 19.28.006(2)(a) for a list of permit exempt work – the work will generally require an electrical permit and inspection. The permit must be obtained prior to beginning any electrical work. Permit fees are generally based upon the addition or alteration of commercial branch circuits described in WAC 296-46B-906(2)(c).

### ● **Rule Development**

The Electrical Program will begin rule development about April 2012. WAC 296-46B will be opened for proposals and a Technical Advisory Committee will be formed to help review proposals and make recommendations to the department. If you are interested in being a part of the program's rule making process and receiving other general Electrical Program information, you should join the Electrical Email List at: <http://www.lni.wa.gov/Main/Listservs/Electrical.asp>

Additional information will also be published in the Electrical Currents newsletter in the coming months.

### ● **New Standard for Light Poles, Effective April 1, 2012**

Underwriters Laboratories has had an electrical standard for light poles under 8' in height for some time. Recently, a new standard, UL 1598, was created for lighting poles from 8' to 100'. As is common when a new standard is implemented, there are very few manufacturers who have completed the listing process with an approved electrical testing laboratory for these tall poles

L&I will not be enforcing a listing or field evaluation requirement for them until April 1, 2012. Beginning on that date, all poles from 8-100' in height will be required to be listed or field evaluated by an approved electrical testing laboratory. All requirements for luminaires and their supporting means, including the requirements of NEC 410.30(B) will be enforced for all lighting poles, metal and non-metallic – hand hole and grounding terminal.

### ● **Answer to This Month's Question of the Month: B) safeguards – NEC 725.2**

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical>

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● **This Month's Question of the Month** - Once a violation of the RCW or WAC becomes a final judgment, each subsequent violation within \_\_\_\_\_ becomes a second or additional offense. A) 1 year, B) 2 years, C) 3 years, D) 4 years – *See the correct answer on page 2.*

● **Note From The Chief**

Recently, a group of electrical contractors were sent a letter notifying them that they were selected to participate in this year's Correction Reduction Initiative. The selected contractors received more than the average number of corrections per inspection during the past year.

Last year's contractor group reduced their corrections per inspection by 26%. This improvement greatly reduced the number of repairs and re-inspections required for their work. That saved them and the program a significant amount of time and money.

Each month, participants in the initiative will receive a summary letter of their previous month's results and a report detailing the number of corrections they received on each jobsite. If you are in the initiative this year, use your reports to identify your most frequently issued corrections so you can reduce your costs and improve the overall quality of your jobs.

● **New Electrical Contractor License and Electrician Certificates Are Coming**

All our licenses and certificates have been redesigned. Electrical contractors and administrators will no longer receive a wallet size card. Electricians, master electricians, and trainees will no longer receive a wall certificate.

Electrician and trainee certificates will be made of material similar to a driver's license and be much more durable. Another feature will be a colored stripe that will indicate to consumers what the certificate is for. A green stripe will indicate that the holder is an 01 general journeyman or 01 general master electrician. A yellow stripe will indicate that the holder is a specialty electrician, specialty master electrician, or an electrical trainee authorized to work without supervision. A red stripe will indicate that the holder is a trainee that requires supervision.

The new certificates and cards will be issued beginning this month. The Electrical Program will not be re-issuing cards/licenses to those who have active licenses/certificates. The new licenses/certificates will be issued through standard renewal, a new license, or a request for a replacement card.

Electricians and trainees must have their certification wallet card with them when on the jobsite along with a separate form of government photo identification.

● **Electrical Board Recruitment – Applications Due Before September 15, 2011**

One Electrical Board position is vacant – Telecommunications Utility representative. The Governor is seeking applicants for this position. Candidates should work for and represent telecommunications utilities in Washington. The term will expire on July 7, 2014.

**Safety Tip of the Month!**

Electrical safety is everyone's responsibility.

Electrical safety should be observed every time you even think about touching something connected to an electrical circuit.

With the invention of electrical testers, circuits are easy to test and with circuit breakers and fuses, circuits can be shut off to avoid contact with electricity all together.

If at all possible, turn the circuit off before testing or working on it.

Applications should be submitted to the Governor. Supporting recommendations and information should also be mailed to the Governor's office. Board information and applications are available on the Governor's website at: <http://www.governor.wa.gov/boards/default.asp>

### ● Pre-inspection Requirements For Wind and Photovoltaic Systems

Before getting your wind or solar photovoltaic system inspected, you must prepare the documentation necessary for the inspector to be able to quickly evaluate your installation for code compliance. WAC 296-46B-445 and 690(3) have similar requirements.

A design review must be available to the inspector, on the jobsite, at the 1<sup>st</sup> inspection. It is helpful to contact the inspection office and provide the design review before requesting inspection. The design review must include copies of the equipment manufacturer's installation information, and a one-line diagram of the design and calculations used to determine voltage and current within the system. The diagram must show all equipment, devices, overcurrent protection, conductor sizing, grounding, ground fault protection, and all system interconnection points.

The design information will also be required before your installation qualifies for production incentives provided by The Renewable Energy Cost Recovery Program. Incentives start at \$0.15 - \$1.08/kWh for solar photovoltaic systems and \$0.12 - \$0.33/kWh for wind systems. Gathering the information required by the inspector before completing the job will help you successfully complete the inspection process and be prepared to get your installation certified for the production incentives. If you have questions about the production incentives, contact Phil Lou, Solar Energy Specialist with the WSU Energy Program at (360) 956-2132 or [loup@energy.wsu.edu](mailto:loup@energy.wsu.edu). For additional program details, see [WAC 458-20-273](#).

### ● Work Outlook Is Improving

The program has seen a growth in permit sales this past year. Of special interest is the growth in plan review workload – up about 50% over last year. Plan review work typically indicates increased electrical construction activity about 5-6 months after the review is completed.

So we can accommodate the current workload and be prepared for a continued increase in inspections, we are bringing back 6 non-permanent electrical inspectors, 1 plan reviewer, and 1 customer service specialist. In the last two years, the program laid off 52 inspection and technical staff and 8 customer service staff due to the recession. Bringing these staff back will enable us to more quickly respond to your needs for inspection, plan review, and licensing.

### ● Provisional Permits Eliminate the Emergency

In 2004, the provisional permit label was created to allow an electrical contractor to begin their electrical work immediately in an emergency situation when a permit is required. Provisional labels allow an electrical contractor to immediately have a valid permit when doing service or maintenance work where the exact nature of the repair is unknown until the electrician is on the job site. In L&I jurisdictions the provisional label is an inexpensive and acceptable substitute for a normal permit for two working days.

Use of the provisional label is similar to a Class B label. The electrician must fill the label out and post it on the jobsite prior to beginning the permitted work. The 2<sup>nd</sup> half of the label must be returned to the local L&I office and a regular permit purchased within 2 working days after beginning the permitted work. For more information, see WAC 296-46B-907.

- **Correction:** In the July 2011, Temporary Services article, the WAC reference should have been WAC 296-46B-901(15) instead of WAC 296-46B-902(15).

### ● Answer to This Month's Question of the Month: C) 3 years – WAC 296-46B-915

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical>

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● **This Month's Question of the Month** - Street lighting circuits may be grounded using a multi-grounded neutral system. A) True, B) False – *See the correct answer on page 2.*

● **Note From The Chief**

The Electrical Program's fiscal year ended June 30<sup>th</sup>. The program's performance goals will be shifting with a focus on better customer service and improving our ability to reduce the effects of the underground economy and people who do not get electrical inspections.

The program's performance measures for the next year include:

- Statewide, doing 94% of all electrical inspections within 48 hours after the inspection request,
- Helping the contractors who received more than the average number of corrections per inspection in the last fiscal year improve the quality of their work – reduce corrections by 15%,
- Increasing focused compliance activity on the underground economy – contractor licensing, electrician certification, and no permit violations,
- Reduce the turn-around time for processing an electrical license to 3 days, and
- Reduce the plan review backlog to 2 weeks for an average set of plans.

We are now beginning the peak summer/fall season for construction activity. Having clear goals will help us to provide better and more consistent service for our customers.

Despite the continuing turbulent economy and large staff reductions during the past two years, we have provided high quality service. It is often difficult to balance between our mission and budget restrictions. Our continued focus on holding expenditures to the lowest possible level, continuous improvement, and meeting/exceeding our performance goals will be key to our future success in the continued improvement of our customer service.

We are in this together – creating affordable excellence.

● **Changes To Electrical Trainee Education Requirements**

Effective **July 1, 2011**, electrical trainees must have **32 hours** of basic electrical classroom education to renew or reactivate their training certificate. This is to enforce changes enacted in the 2010 legislative session to [RCW 19.28.161](#).

This means that for a trainee certificate to be renewed or reactivated on or after July 1, 2011, and prior to June 30, 2013, the trainee must have 32 hours of reported basic classroom instruction regardless of when the renewal fee was paid.

**I paid my renewal fee prior to June 30, 2011 how many hours will I need to renew or reactivate my training certificate?**

*If you had 16 hours of training **reported** to the department by June 30, 2011, your certificate will be issued with the 16 hours. If your hours are not **reported** to the department by June 30, 2011, you will need to complete 32 hours for your certificate to be issued.*

Effective **July 1, 2013**, electrical trainees will be required to have **48 hours** of reported basic classroom education to renew or reactivate their training certificate.

If your training certificate is placed inactive for lack of education, the class sponsor must have reported the required hours – 32 hours - July 1, 2011 to June 30, 2013 or 48 hours - July 1, 2013 and later.

**Safety Tip of the Month!**

Before removing any fuse from a circuit, be sure the switch for the circuit is open or disconnected.

When removing fuses, use an approved fuse puller and break contact on the hot side of the circuit first.

When replacing a fuse, install the fuse into the load side of the fuse clip first, then into the line side.

**● Correction Reduction Initiative**

The program's Correction Reduction Initiative will continue next year. In July, a new list of contractors will be developed for the coming twelve months. This last year, the identified contractor group reduced their corrections per inspection by over 20%. This year's group will again include all contractors who have more corrections per inspection than the average electrical contractor.

Because the need to reduce corrections is more important than ever, the program will continue to be proactive in helping all contractors reduce their corrections and the related reinspections. We will be closely watching for contractors who routinely have the same type of corrections on their jobs or are not improving the quality of their jobs. We will be contacting and working with those contractors to reduce their corrections. Contractors should use their monthly reports and these contacts to improve the quality of their jobs, while saving them and the Electrical Program time and money.

**● Temporary Services – Modifying and Installations by General Contractors**

Inspectors have been finding many temporary service installations that have been modified after the initial inspection approval. If any installation is modified, after the approval, a supplementary electrical permit and inspections is required. An example is when a hard wired feeder is connected to a temporary service panel board. Temporary services and systems may be expanded without a supplementary permit and inspection if all the connections are made by plug and cord. A permit and inspection is required when any hard wired connections are made.

Several general contractors have been found installing temporary services and feeders that are not in compliance with the WAC requirements. General contractors are allowed to make limited temporary power connections, using the owner's exemption, per WAC 296-46B-901(15). The contractor must be registered as a general contractor under chapter 18.27 RCW. The contractor can install a single electrical service per address for the purposes of temporary power during the construction phases of a project. General contractors cannot install feeders from that service unless they are cord and plug to a 50 ampere or smaller receptacle at the service. This means, a general can never connect a job site office or trailer to the temporary service. The general will need to contract all hard wired work to an electrical contractor.

The general contractor must meet all the following conditions and limitations:

- The installation is limited to the mounting and bracing of a preassembled pole or pedestal mounted service, the installation of a ground rod or ground plate, and the connection of the grounding electrode conductor to the ground rod or plate;
- The total service size does not exceed 200 amperes, 250 volts nominal;
- The service supplies no feeders;
- Branch circuits not exceeding 50 amperes each are permitted, provided such branch circuits supply only receptacles that are either part of the service equipment or are mounted on the same pole;
- The general contractor owns the electrical equipment;
- The general contractor has been hired by the property owner as the general contractor for the project;
- The general contractor must purchase an electrical work permit for the temporary service, request inspection, and obtain approval prior to energizing the service.

**● Answer to This Month's Question of the Month: B) False – 2008 NEC 250.20**



**This Month's Question of the Month** – A contractor using a provisional permit to begin electrical work must return the contractor portion of the label to L&I within \_\_\_ days after affixing the jobsite portion of the label. A) 1, B) 2, C) 15, D) 20 – See the correct answer on page 2.

● **Note From The Chief**

Electrical Technical Specialist, Doug Erickson, long time member of the L&I Electrical Program, is retiring June 30<sup>th</sup>. Doug and I have worked together through an amazing range of roles, challenges, and successes during the thirteen years we have worked together. He has been a tremendous leader, an invaluable member of my leadership team, a trusted colleague, and a great friend.

He has had a tremendous impact on our program and the electrical industry. During his time at L&I, Doug has inspired new ideas, driven innovation, and taken risks to improve the program and the industry. He helped lead the Electrical Program into the 21<sup>st</sup> century.

I will miss Doug and I know that all of us who have worked with him over the years will greatly feel this loss. At the same time, I am happy to know that he will be enjoying a well earned retirement from his many years of public service. I am very grateful for his insights and support during these past years.

Please join me in congratulating Doug on a job well done and wishing him well in his new adventure.

● **Passed That Specialty Electrician Exam? Keep Your Training Certificate?**

When you pass a specialty electrician examination and receive your specialty certification, you are only allowed to work in that specialty as an unsupervised specialty electrician. If you want to work in or gain on-the-job experience towards qualifying for another specialty or the journeyman electrician examination, you must keep your training certificate in active status and work under the appropriate supervision in that specialty.

It is not uncommon for an individual to qualify for and pass a specialty examination and then let the training certificate lapse. That is OK, but it prevents the individual from gaining additional experience towards another specialty or towards the journeyman electrician examination. Many specialty electricians keep their training certificate active so they can continue to do work in all the electrical scopes and gain additional experience.

If you do not have an active training certificate and are found to be working in a specialty where you do not have certification, you and the contractor you are working for may receive civil penalties. You will not be allowed to use that experience towards examination qualification.

● **Class B Permit Labels – When They Are Not Allowed**

WAC 296-46B-908(7)(b) lists the specific types of work where a Class B, random inspection, label cannot be used.

- Areas classified as Class (I), Class (II), or Class (III),
- Areas regulated by NEC 517 or 680,
- Any work where electrical plan review is required, or fire alarm, nurse call, lighting control, industrial automation/control or energy management systems.

Class B labels can never be used for these types of work, no matter how small the scale of the work being done. Several other articles regarding Class B restrictions have been written. See the *Electrical Currents* for January 2010,

**Safety Tip of the Month!**

The Consumer Product Safety Commission reports a significant upward trend in injuries from the use of inflatable rides and structures.

CPSC's annual report shows 4 fatalities and 4,900 injuries requiring emergency room treatment in the U.S.

Make certain the ride/structure you and your family uses has an L&I operating label. The label is issued when the ride/structure has had an annual inspection and the operator has insurance. The label must be visible on all amusement rides and structures.

January 2007, December 2006, and December 2005. All back issues are available at:  
<http://lni.wa.gov/TradesLicensing/Electrical/WhatsNew/Currents/default.asp>.

Installers should also be aware that the Class A list of permit exempt items does not include devices like: fire/smoke detectors, nurse call stations, burglar alarm detection devices, etc. A complete list of Class A exempt items is in WAC 296-46B-901(8)(b).

### ● Traffic Management Systems

WAC 296-46B-010(15) through (22) describes the inspection process and equipment approval process for traffic management systems. A traffic management system can provide signalization for controlling vehicular, pedestrian, or rolling stock traffic. Traffic management systems include:

- Traffic illumination, signal, and monitoring systems,
- The electrical service cabinet and all related components and equipment installed on the load side of the service cabinet supplying electrical power to the traffic management system, and
- Signalization systems necessary for the operation of a light rail system.

WAC 296-46B-010(16) lists the standards allowed to be used in evaluating traffic management system components. Paragraph (21) allows the local government jurisdiction (i.e. transportation authority) to act as the certifying authority for the safety evaluation of all components. This includes all equipment and wiring. There is a requirement that the service cabinet must be listed by an approved electrical testing laboratory or only contain electrical testing laboratory listed components. If the local government traffic jurisdiction chooses to evaluate equipment for safety, it must identify the controller cabinet or system components with an identification plate (WAC 296-46B-100(38)). The plate must be inside the cabinet and may be attached with a suitable adhesive.

WAC 296-46B-010(17) says induction loops or similar circuits with no electrical hazard do not require inspection. WAC 296-46B-100(22) says that conductors of different circuits are permitted to be in the same raceway without regard to voltage characteristics provided all electrical conductors are insulated for the maximum nominal voltage of any conductor in the raceway. This allows limited energy and line voltage conductors to be in the same raceway. Fiber optical cables may also be in a raceway with electrical conductors. Fiber optical cables will only have a voltage rating when they are a multi-use cable (i.e. fiber and electrical within the same cable).

WAC 296-46B-010(20) describes the requirements for underground inspection. When a raceway is installed without an open trench (e.g. plowing, boring, etc.), a visual inspection is not required. The permit purchaser must coordinate the visual inspection of raceway installed in open trenches by providing a written inspection request at least two working days prior to the day inspection is needed. If the underground raceway inspection cannot be made at the time of inspection, the raceway may be covered after inspection by the local government jurisdiction's (i.e. traffic) project inspector/designee. Written documentation of the local government jurisdiction's inspection must be provided to the department when requested. The written documentation must contain: the date and time the inspection was done, location, installing firm, owner, type of raceway, size of raceway, depth of raceway, and the project inspector/designee's name and contact information.

Jurisdictions are considered to be owners of the traffic management systems when doing electrical work on their system or on the system of another jurisdiction when working under a valid Interlocal agreement as permitted by chapter 39.34 RCW.

Jurisdictions with an established chapter RCW 19.28 electrical inspection authority (i.e. city electrical inspectors) and WSDOT may only perform electrical inspection on their rights of way or for each other by Interlocal agreement. Transportation authorities are not allowed to do electrical inspections except for underground conduit only as allowed in WAC 296-46B-010(20)(b).

### ● Answer to This Month's Question of the Month:

B) 2 – See WAC 296-46B-907(2)(e).



**This Month's Question of the Month** – Grounded DC photovoltaic arrays shall be provided with \_\_\_\_\_ to reduce fire hazards. A) flame-proof support structures, B) high temperature-limiting switches, C) arc-fault protection, D) DC ground-fault protection – *See the correct answer on page 2.*

● **Note From The Chief**

The Electrical Program is embarking on a long-term plan to become even more efficient and effective. We will be using the Toyota Production System's LEAN process to eliminate waste and standardize our processes. LEAN is a set of concepts, principles, and tools used to create and deliver the most value while consuming the fewest resources. Why

LEAN? L&I's goal is to engage all program staff in continuous improvement to achieve the best quality, the shortest lead time, the lowest cost, the best safety, and the highest morale. LEAN has proven to achieve results.

LEAN addresses problems at the systems level and within individual processes. Customer needs define value for the process. LEAN distinguishes steps that create value from those that do not. It reduces waste and builds in quality. LEAN is a systematic problem solving method that is where successes and failures can be evaluated and documented. Using LEAN means successes can be repeated and implemented on a statewide basis.

Inspectors in the Everett and Tukwila offices have teamed together to create this new culture within the Electrical Program. For them, there are three primary areas of focus:

- Improving our response times for our inspections,
- Focusing our compliance efforts on the underground economy and contractors that do not get electrical inspections, and
- Improving the quality of our compliance efforts.

The results of their efforts will be implemented across the state next winter. As a result, our customers will see better and more consistent overall service and a reduction in the negative impacts of the underground economy.

A LEAN culture is based upon continuous improvement and respect for people. We will continue to challenge ourselves to provide a better product with less waste. This aligns with L&I's mission of *Keeping Washington Safe & Working* by providing safety, service, and value.

● **WAC Rule Change – Trainee Education Requirements**

Beginning July 1<sup>st</sup>, all trainees seeking to renew their training certificate must have completed 32 hours of electrical trainee classroom education. On July 1, 2013, renewals will require 48 hours of classroom time. This legislation passed in the 2010 legislative session. There are no alternatives to having the required training.

● **Electrical Board**

The Electrical Board has lost 33 years of board experience. Gloria Ashford - Chair, Jim Simmons – Vice Chair, and David Bowman are all ending their third terms on the board. They have each served as your representatives for eleven years. Each has been a great asset to the board and the electrical industry. They will all be greatly missed. Their years of service have shown them to be leaders in state service and the electrical industry.

● **No Access For Inspection**

By far, the number one correction issued by electrical inspectors continues to be for no access to do the inspection. There are several things to remember when a contractor talks with their customers and requests inspections. The best way to request an inspection is by using L&I's on-line inspection request system. The

**Safety Tip of the Month!**

[CPSC, National Electrical Safety Foundation Urge Consumers to Plug Into Electrical Safety](#)

The U.S. Consumer Product Safety Commission (CPSC) and the National Electrical Safety Foundation (NESF) are urging consumers to look for and correct electrical safety hazards in their homes this May as part of National Electrical Safety Month.

request will be downloaded by the inspector the next morning and placed in the inspector's queue for inspection. Statewide, 89% of inspections are made within 48 hours. Longer delays may happen with sudden upswings in inspection requests or in remote areas.

Especially in occupied buildings, the contractor must ensure the customer is aware of the requirement for inspections and the need to work with L&I's inspectors in scheduling inspections. This can be accomplished in several ways. Many contractors provide the customer a flyer that details the requirement for inspection, the customer's responsibility to help to ensure the inspection is made, and that the customer will be held accountable if they block inspection access or fail to help the inspector to make the inspection happen.

If the contractor enters a comment in the on-line system asking the inspector to arrange access prior to making the inspection, the inspector will make two calls to the customer asking for a call back. If the customer fails to call back, the inspector will go to the site in an attempt to make the inspection. If the customer is available, the inspection will be made. If not, the inspector will leave a *No Access* door hanger and assess the contractor a trip fee. The responsibility for arranging access is then shifted back to the contractor. The contractor must work with the customer to ensure the inspector can gain access to make the inspection.

Many contractors immediately send the customer a certified letter or other confirmed method informing the customer that if they fail to communicate with the inspector and arrange the inspection they will be accountable – possible loss of power, citation, etc. The contractor should talk with the local inspection supervisor and communicate all actions being taken to ensure that the inspection will be made. If the contractor makes a good faith effort in arranging the inspection access, L&I will shift its focus to the customer in making the inspection happen. If the contractor is making every effort to arrange the inspection, additional fees and compliance action towards the contractor will likely be unnecessary.

Contractors should work with the local supervisor to help reduce the number of no access inspections. Eliminate the frustration and time and money wasted on these inspections. Once an inspection has been arranged with a customer, the inspector will do everything possible to make the inspection when it was arranged. If the inspector is delayed, for any reason, the inspector will make every effort to contact the customer as soon as possible to explain the situation and make other arrangements.

### ● Photovoltaic Fees

For electrical permit fee purposes, photo voltaic (PV) systems should be considered a generator. WAC 296-46B-906(5)(g) tells you to use the appropriate residential or commercial new service or feeder section to calculate the fees for a permanent generator. Each direct current PV system has at least one inverter. For fee calculation, the output rating of the largest inverter will determine the initial feeder size. Each additional inverter will be considered an additional feeder when calculating the total fee.

When micro inverters, 500 watts or smaller, are connected together and supply a single output circuit, the entire micro inverter circuit will be considered as one feeder. Additional circuits supplied by micro inverters will be considered to be separate feeders.

When an overcurrent device or panelboard (e.g. circuit breaker, combiner panel, etc.), rated 30 amperes or larger, is on the input side of an inverter, the device's/panel's output wiring will also be considered to be a feeder.

In a new residence: For a PV system with three inverters with an output rating from 0 to 200 amperes, the fee for the PV system will be \$148.80 (i.e. \$93.40 for the first inverter and \$27.70 for each of the two remaining inverters).

In a new nonresidential installation: For a PV system with three inverters with each having an output rating from 0 to 100 amperes and a DC combiner with an overcurrent device rated 50 amperes, the fee for the PV system will be \$264.70 (i.e. \$93.40 for the first inverter and \$57.10 for each of the two remaining inverters and \$57.10 for the combiner overcurrent device).

### ● Answer to This Month's Question of the Month: D) DC ground-fault protection – NEC 690.5



**This Month's Question of the Month** – Power factor is the ratio of \_\_\_\_\_ power or watts to \_\_\_\_\_ power or volt amps. – See the correct answer on page 2.

● **Note From The Chief – protect yourself by using a licensed electrical contractor**

Homeowners, beware of unscrupulous general contractors who say they are qualified to do your electrical work. Any contractor doing any type of electrical work – wiring, maintenance, repair, etc. – must be a licensed electrical contractor. Here is a true story example of how you can be taken advantage of.

An unknowing homeowner hired a general contractor to do a kitchen remodel. The general told the homeowner no electrical permit was necessary even though outlets and lighting were being relocated and added. The homeowner did ask if the general was going to do the electrical work or if he was going to sub it out. The general responded by saying the John (not the real name) was an electrician and worked for him, the general part time.

The first problem happened when digging outside the basement stairs. The general dug up and damaged the utility service conductors going to the house. John made the repair by cutting the wires, relocating them, and re-splicing the wires. It was only three wires. That evening the exterior garage's mercury vapor light outside came on and within a couple of minutes turned red hot and began to burn. Luckily, the homeowner was outside and knew enough to quickly turn off the garage panel's main breaker. Unluckily, the homeowner was shocked after just getting close to the panel. Luckily, the homeowner knew enough to retreat and turn off the main breaker to the house. The next day, the general had his "electrician" – John – make a repair and actually connect the correct wires together. Two days later, the general "had" to undo the wires again and relocate them because they were in the way of a concrete pour.

Unfortunately, that was not the end to the story. The general installed several can lights and had to call the "electrician," John, in again to troubleshoot. Most of the wire nuts were loose and the wiring had come apart. One receptacle in a nearby bedroom is still not working after the remodel.

The homeowner has since hired a legitimate electrical contractor to make the necessary repairs, but only after paying the general contractor several thousand dollars for his high quality electrical work. The only good news in this story is that nobody was killed as a result of the incompetence of the general and his "electrician."

PROTECT YOURSELF! Use the L&I website to look up your contractor and his compliance history.

<http://www.lni.wa.gov/TradesLicensing/Contractors/HireCon/default.asp>

Make certain he has an electrical contractor's license. You can also check the contractor's permit history at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/FeePermlnsp/LookupPermlnsp/>

● **Nonprofit Organizations – Contractor Exemptions**

In the 2003 Legislative Session a bill was passed that allows an electrical contractor licensing exemption for a nonprofit corporation under 26 U.S.C. Sec. 501 (c)(3). The bill also allows the nonprofit corporation to use appropriately certified electricians and supervised trainees to perform electrical installation, repair, or maintenance on the corporation's facilities. Volunteer electricians and trainees cannot receive any type of compensation for the work.

The total value of the electrical work (e.g. design, labor, materials, equipment, permits, etc.) – entire project – cannot exceed \$30,000. The work cannot be parceled into smaller portions in an attempt to stay below the \$30,000 maximum.

**Safety Tip of the Month!**

Don't even think about bypassing or removing a ground fault circuit or arc fault circuit protection device(s).

They protect lives and property!

This is a serious violation and you will lose your license or certificate if you do it.

Although exempt from electrical contractor licensing, the nonprofit corporation must obtain the proper electrical work permits and ensure they follow all electrician certification and trainee supervision ratio requirements of chapter 19.28 RCW. Any group attempting to purchase a permit under this new exemption should be prepared to supply a copy of the “qualifying” letter from the Internal Revenue Service (IRS) granting the entity the right to claim 501(c)(3) non-profit status. According to federal requirements, U.S.C. Sec. 501 (c)(3) nonprofit corporations include corporations, and any community chest, fund, or foundation organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary, or educational purposes, or to foster national or international amateur sports competition, or for the prevention of cruelty to children or animals. None of the corporation’s net earnings may benefit any private shareholder or individual. No activities may carry on propaganda, influence legislation, or intervene in any political campaigns for public office.

The statute change did not grant these exemptions to U.S.C. Sec. 501(c)(4) entities (e.g. civic leagues, social welfare organizations, and local associations of employees with earnings devoted exclusively to charitable, educational, or recreational purposes).

● **Air Conditioner or Heat Pump – Class B Usage**

A heat pump is considered to be the same as an air conditioner for the purposes of using a Class B inspection label. The use of a Class B label is allowed for the:

- Like-in-kind replacement of the internal wiring of an air conditioner/heat pump; or
- Like-in-kind replacement of and air conditioning/heat pump unit not exceeding 240 volts, 30 minimum circuit amps (MCA) when the unit is connected to an existing branch circuit.

● **Identification Plates/Labels/Signs**

It is important that identification plates/labels/signs be installed to identify the equipment/circuit that is being disconnected. This identification plate/label/ sign must be an identification plate as described in WAC 296-46B-100(38) or an adhesive label approved by the electrical inspector.

Identification plates are required in several locations in the National Electrical Code. Here are some locations:

|         |                                      |               |   |
|---------|--------------------------------------|---------------|---|
| 110.22  | Disconnecting means                  | 690.5         | PV system – ground fault protection   |
| 404.6   | Switches                             | 690.7         | PV system – bipolar source and output                                       |
| 430.75  | Motor control circuits               | 690.53        | PV system – DC power source   |
| 430.102 | Motor controllers                    | 690.64        | PV system – Inverter output connection                                      |
| 430.113 | Multiple sources of power            | 700, 701, 702 | Emergency, legally required, and option standby systems (700, 701, & 702.8) |
| 490     | Over 600 volts (490..21, .22, & .44) | 705.12        | Interconnected system – inverter output connection                          |
| 520.27  | Stage switchboards                   |               |   |

Don’t forget to install all the required identification plates, labels, and signs that help remind people of electrical hazards.

● **Arc Fault Circuit Interrupters – New Products**

There are now some solutions available that will allow contractors to meet National Electrical Code AFCI requirements. With the release of the UL listed Cooper AFCI receptacle you no longer have to change out the panel if an AFCI breaker won’t fit. It will also work for protecting some circuit extensions. Siemens also now has a listed 2-pole AFCI breaker that will be useful in some situations.

● **Answer to This Month’s Question of the Month:**

Power factor is the ratio of true power or watts to apparent power or volt amps.



**This Month's Question of the Month** – During contact with an energized component, what amperage level will cause loss of muscle control in a male, in a female? – *See the correct answer on page 2.*

● **Note From The Chief**

Field inspectors are continuing to find many installations with serious corrections where the inspection is not ready to be passed. In January alone, L&I inspectors issued 4,092 serious corrections. Any one of these corrections is considered serious enough to prevent inspection approval or the authorization to energize power. Each installer and contractor should review the *Electrical Currents – Note From The Chief*, November and December 2010, for more on this problem. (All back issues are available at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/WhatsNew/Currents/default.asp>.)

Inspectors are expected to stop the inspection process and to issue a trip fee for the inspection not being ready when they encounter inspection stopping problems. As stated in the November 2010, *Electrical Currents*, "The contractor must then pay the assessed trip fee, make the corrections noted, and do the required quality assurance before requesting a re-inspection. When the inspector returns, the remainder of the job will be inspected, including the repairs for the corrections previously noted. The job should be ready to be passed each time an inspection request is made."

Being "ready to be passed" means that the contractor and/or the assigned Administrator/Master Electrician have ensured that the work is installed to code and complete before the inspection request is made. Contractors who continually have the same serious violations may be issued additional civil penalties for their improper work.

● **"Classified" Retrofit Kits**

Electrical testing laboratories are increasingly using the electrical testing laboratories' classification process in lieu of product listing or field evaluation as a safety evaluation method for retrofit kits and other product evaluations – especially for LED lighting and other energy conservation measures. L&I has not accepted the classification process as a substitute for listing or field evaluation, except for replacement circuit breakers. Unlike product listing, testing laboratories do not consider classification as a complete product evaluation process.

Testing laboratories have told L&I that they cannot assure the use of a classified product without field inspection by the electrical inspector. Testing laboratories have also indicated that the use of a classified product should be restricted to within a product that is also listed by the classifying laboratory.

L&I will not allow the use of a classification label for:

- Any work related to the use of a Class B, random inspection, inspection label;
- Ensuring product acceptability for stand-alone electrical equipment; or
- Use on any equipment that has an engineer approval label.

L&I will allow the use of a classification label if all the following conditions are met:

- The classified product is only used in a retrofit situation.
- The installer:
  - Buys an electrical permit and gets all electrical work inspected;
  - Follows all the manufacturer's instructions and codes;
  - Makes a copy of the manufacturer's instructions available to the inspector during the inspection;

**Safety Tip of the Month!**

The impedance of the fault current path plays a critical role in removing dangerous voltages from metal parts and preventing electric shock by facilitating the opening of the branch-circuit overcurrent protection device.

Be sure you don't take this path for granted. Do not rely on the earth as a grounding conductor. Terminate equipment-grounding conductors properly and make sure all mechanical connections are secure.

One final tip: Only a GFCI can protect you from direct contact with an energized conductor.

- Applies a label, made of a background color contrasting to the listed product, in a visible location near the classified product that says, *“This equipment contains a Classified product that may present a risk of electrical hazard if the manufacturer’s instructions are not followed exactly.”* The label’s font must be Ariel size 16 bold. This label may be an identification plate as described in WAC 296-46B-100(38) or an adhesive label approved by the electrical inspector. This label is in addition to any labeling required by the manufacturer’s instructions or the electrical standard used to manufacture the classified product; and
- Removes all parts of the replaced component(s) so that the new configuration is clearly evident to the consumer (e.g. Remove the ballast and associated wiring when a LED classified retrofit kit is used to replace fluorescent ballast).
- The classified product is used to replace a component(s) on or within a product already listed or field evaluated by the testing laboratory classifying the replacement component – that is: a UL classification label should only be used within a UL listed product; an ETL classification label should only be used within an ETL listed product, etc.

● **WAC Rule Public Hearing**

Before the Governor’s Executive Order last fall, the Electrical Program opened the electrical rules for proposed changes. After carefully evaluating each of these proposals, the department determined that the proposals did not meet the Executive Policy Office’s guidelines for moving forward with a critical rule change. The only section that will be amended will be to implement of SHB 2546 – a requirement for additional trainee classroom education as required by the legislature in the 2010 legislative session.

At the January 27<sup>th</sup> Electrical Board meeting, the board discussed the options for rule making (e.g. NEC 2011 adoption, technical and administrative changes, etc.) and unanimously recommended to only move forward with the implementation of SHB 2546.

A public hearing will be held April 26, 2011, on the rule proposal at the L&I building – 7273 Linderson Way, Tumwater. Written comments will be accepted between March 22<sup>nd</sup> and April 26, 2011. The rule will be effective on July 1, 2011.

● **Service Connection By An Electric Utility**

The authorization for an electric utility to connect or re-connect an electrical service is limited in the electrical law. For all services – both new and existing services where power has been disconnected from the premises wiring system – there must always be a permit posted on the jobsite. The electric utility is only authorized to connect or re-connect power based upon RCW 19.28.101(2) and (5). Below are the only scenarios when a utility is authorized to connect or re-connect power:

1. RCW 19.28.101(5) – The electric utility may connect a new service if:
  - Approval has been granted by the electrical inspector; and
  - Approval is posted or otherwise communicated by the inspector to the utility,
2. RCW 19.28.101(2) – The electric utility has the discretion to connect a service when:
  - It can verify that a permit is posted on the jobsite; and
  - The electrical inspector has received a written request for inspection, but cannot complete the inspection within twenty-four hours; and
  - If the service relates to a mobile home, a current building permit from the local building official is posted.
3. RCW 19.28.101(5) – The electric utility has the discretion to immediately reconnect a service that has been increased in size or relocated before the inspector’s approval if an electrical permit is posted.

In scenario 2 and 3, the utility may choose to not connect power until the inspection is complete and approved. For instance, if the customer asks the utility to disconnect power so that a main service breaker or other equipment can be replaced or repaired and the service has not been increased or relocated, the utility is only allowed to re-connect power when all the requirements in scenario 1 or 2 are fully met.

● **Answer to This Month’s Question of the Month:**

15 milliamperes in a male or 9 milliamperes in a female for .43 seconds (IEEE).

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical>



**This Month's Question of the Month** – A child was born in Boston, Massachusetts, to parents who were born in Boston, Massachusetts. But, the child was not a US citizen. How is this possible? – See the correct answer on page 2.

● **Note From The Chief**

The Electrical Program's online permitting and inspection system has reached record levels of usage. 95% of all contractor permits and 44% of all property owner permits are now purchased online. 78% of contractor and 26% of property owner inspection requests are now made online. If you have not made the move to online permitting and inspection requests, you are losing out on the savings in time and money that are available to you. Speed up your projects by going online for your permitting, inspection, and license renewal needs.

● **Study Before You Test**

Everyone wanting to take an electrician examination must be prepared. It is the individual's and the contractor's responsibility to ensure that the individual gets the training necessary to become a quality electrician. Electrician exam results show this is not happening on a consistent basis. Electrician candidates had an overall 50% pass rate. This may sound low, but, almost 2/3<sup>rd</sup>s of all 01 journeyman candidates passed their examinations.

Of primary concern are specialty electrician candidates. Specialty candidates had a very low pass rate of 38%. All specialty contractors and candidates should make a better effort to ensure the candidate receives appropriate training. Quality electricians will improve the safety of electrical installations for consumers and will save the contractors they work for time and money by doing better work that does not require call backs for repairs.

● **LED Street & Area Lighting Retrofits**

Because of energy conservation measures and new technology, local governments and developers are retrofitting existing street and area pole lights with LED technology. LED's provide extremely long lamp life and use much less electricity to operate.

Many existing installations utilize heavy-duty lamp holders in the luminaire. National Electrical Code (NEC) 210.23(B) & (C) allows non-residential fixed lighting units to be supplied by 30, 40, or 50 ampere branch circuits when the luminaire uses a heavy-duty lamp holder. This creates a problem, with LED retrofits, where an existing 30, 40, or 50 ampere branch circuit is installed. The new LED lamps do not use heavy-duty lamp holders. When a standard lamp holder is used, NEC 210.23(A) limits the branch circuit size to 15 or 20 amperes.

In order to accommodate the changing technology and provide an appropriate level of safety, L&I will allow the use of existing 30, 40, and 50 ampere branch circuits on non-residential street and area lighting LED retrofits when all the following conditions are met:

- The LED replacement luminaire must be listed or a listed or a classified LED retrofit kit must be used;
- The branch circuit's overcurrent protection device must have ground fault circuit interrupter protection for personnel;
- There must be supplementary overcurrent protection for each ungrounded conductor at the base of each lighting pole or adjacent junction box;
- The supplementary overcurrent protection device must be no larger than 125% of the calculated continuous ampere load for the lighting on that pole;
- The supplementary overcurrent protection device must be capable of being removed without exposing any live parts; and

**Safety Tip of the Month!**

During a typical year in the U.S.A., home electrical wiring problems account for 67,800 fires, 485 deaths, and \$868 million in property losses.

Home electrical wiring causes twice as many fires as electrical appliances (U.S. Fire Administration).

Get your electrical work permitted and inspected!

- At the access point to each supplementary overcurrent protection device, a label must be installed that says that access to the supplementary overcurrent protection device is limited only to certified electricians or linemen as allowed in RCW 19.28.261(6)(b).

This variance will allow LED retrofits to occur without changing the underground wiring for the branch circuit. Meeting these minimum installation requirements will maintain the safety of the installation at a level that meets the intent of the NEC and will allow the continued use of most existing lighting branch circuits.

● **(06) or (09) Licensing & Certification?**

We have been asked to clarify which specialties are allowed to do work associated with various technologies used in the installation of telecommunications type equipment.

During the development of the telecommunications bill in the 2000 legislative session, telecom industry representatives agreed that telecom workers would only install voice, data, video, and limited audio cables at signal levels well below the level of limited energy (typically Class 2) power conductors. For this concession, telecommunications workers were not required to have individual certification. The installation and maintenance of limited energy power conductors, including all power over Ethernet (POE) circuits, remained exclusive to the (06) limited energy specialty scope requiring (06) contractor licensing and (06) electrician certification.

RCW 129.28.400(13)(b), allows “*other limited-energy interconnections associated with telecommunications systems or appliances.*” This exception allows the installation of local plug-in Class 2 power to supply fixed telecommunications equipment (e.g. plug-in power supply to phone equipment or wireless alarm panel, etc.).

Below are some examples of some possible licensing and certification scenarios:

| Example:   | License Type |
|--|--------------|
| 1. Power over Ethernet – where the power for the equipment is superimposed over the data cable supplying the equipment.  | 06           |
| 2. Separate low voltage and data cable(s) supply equipment.  | 06           |
| 3. Equipment is powered using a listed Class 2 power supply/transformer plugged into a local electrical outlet, installed by an electrician, where there is no external power feed (i.e. data only) from the equipment to other remote equipment/device. | 09 or 06     |
| 4. Cable only installation (excluding coaxial only or fiber optical cable)   | 06           |
| 5. Cable only installation (including only coaxial only or fiber optical cable)  | 09 or 06     |

● **What Questions Are Allowed To Be Answered By An Electrical Inspector**

Electrical inspectors are faced with many different types of questions from consumers, contractors, and electricians. WAC 296-46B-010(2) ensures a level playing field by placing limits on the types of questions an inspector may answer. Inspectors cannot “*lay out work or act as consultants for contractors, owners, or users.*” Inspectors are only allowed to answer specific code questions.

Many people call to ask if they “*can just run something by*” the inspector. Inspectors are not allowed to enter into discussions about project bidding or design or other “*what if*” scenarios. It is not the Inspector’s role to choose or even make recommendations between design or installation options for the installer. The installer is responsible for the entire decision making process from bidding, to permit fees, to installation.

If you have a specific question about a code interpretation or would like to discuss corrections you have been issued, the inspector or the supervisor is available to get you an answer. If you need to arrange inspection access, take advantage of your ability to communicate directly to the inspector by entering detailed access instructions in the comments field on your inspection request. If access conditions change at the last minute, our customer service staff is available to assist you.

● **Answer to This Month’s Question of the Month:**

D) The child was born before 1776.



## ● This Month's Question of the Month

If an administrator or electrician fails to renew their certificate within \_\_\_\_ days they must retest and pass the exam before being allowed to renew. A) 30 B) 60 C) 90 D) 120 – See the correct answer on page 2.

## ● Note From The Chief

The Electrical Program is responding to contractor and consumer requests by adding two members to the E-CORE compliance team. New team member Rand Jones (206-515-2773) will be primarily working Regions 1 & 2 – King County and north. A second position will be working primarily in Region 5 – central Washington from Oregon to Canada. The E-CORE team is very effective in reducing the effects of the underground economy, eliminate fraud, improve the economic vitality of business and individuals, improve the electrical safety of people and property, and increase awareness of the underground economy's negative impact on consumers and businesses; but, there is always more work for them.

## ● Electrical Board Recruitment – Applications Due Before February 1, 2011

Four Electrical Board positions are due for re-appointment by the Governor on July 7, 2011, and one electrician position is now vacant. We are seeking applications from: two electrical contractors, two electricians, and one electrical manufacturer. Contractor candidates must be an owner, member of a firm, or represent an electrical contractors' association. Electrician candidates must be a certified electrician and not have ownership in an electrical contracting business. The manufacturer candidate must represent an electrical manufacturer or an electrical manufacturing association.

The re-appointed positions have a four year term and the vacancy will serve until July 7, 2014. Applications should be submitted to the Governor. Supporting recommendations and information should be mailed to the Governor's office. Board information and applications are available on the Governor's website at:

<http://www.governor.wa.gov/boards/default.asp>

## ● WAC Rule Update

On November 17, 2010, the Governor signed Executive Order, 10-06. The order suspends non-critical rule development and adoption until December 31, 2011. The order and the guidelines from the Governor's Executive Policy Office recognized the benefits of a stable regulatory environment.

House Bill 2546 passed during the 2010 Legislative session. It increases the required classroom education hours an electrical trainee must have in order to renew their electrical training certificate. The department is required to adopt rules in order to implement HB 2546 by July 1, 2011. Before the Executive Order was signed, the Electrical Program opened the electrical rule for proposed changes. The program developed proposals and also received several proposals from stakeholders. After carefully evaluating each of these proposals, L&I has determined that none meet the Executive Policy Office's guidelines for moving forward with a critical rule change. Rulemaking for WAC 296-46B will proceed, but will be limited to the implementation of HB 2546.

## ● Split System HVAC Equipment

Because of energy conservation concerns and new equipment technology, HVAC contractors are installing more and more split system HVAC units. The systems that are being manufactured meet the intent of the National Electrical Code (NEC); but, not necessarily the letter of the code. In order to better align current industry standards, equipment manufacturing processes, and the NEC, L&I inspectors will accept the following variances from the NEC.

- In one and two-family dwellings units, a disconnecting means is not required for the indoor unit(s) of a split system HVAC/R system if:
  - An indoor disconnecting means is not required by the manufacturer;
  - The indoor unit(s) is exclusively powered from the outdoor unit; and

### Safety Tip of the Month!

Plan every job and think about what could go wrong.

Use the right tools for the job.

Think safety. Live Safely!

- The outside unit's disconnecting means is lockable and identifies the location of the indoor unit.
- For split system installations, Type TC cable may be used in any location allowed for nonmetallic-sheathed cable in NEC 334 if all the installation requirements in NEC 336 and 334 and WAC 296-46B-334 are met.

### ● Field Evaluations & Temporary Power For Equipment Testing

It is not uncommon for electrical inspectors to find equipment that has not been listed by an approved electrical testing laboratory. When unlisted equipment is found, the inspector will issue a correction notice to the installer. The equipment must not be operated until the inspection is approved.

The owner or installer must contract directly with an approved electrical testing laboratory or for industrial equipment as allowed in WAC 296-46B-903 an approved engineer to get the equipment approved and labeled. You can find a list of all approved laboratories and engineers at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/Install/default.asp>

In an effort to expedite the equipment evaluation process, approved testing laboratories and engineers may immediately begin the evaluation process without requesting permission from L&I. Laboratories and engineers no longer need to request permission to perform field evaluations or engineer reviews. Except for the owner's final report, no reports are necessary. The equipment may only be operated temporarily as necessary to allow completion of the evaluation process. When the laboratory or engineer approval label is placed on the equipment:

- The laboratory or engineer will send the final evaluation report to the equipment owner within 30 days; and
- The installer may request a re-inspection to remove the correction notice so that the equipment can be operated on a permanent basis.

During the re-inspection, the inspector may post a correction and make a referral to the laboratory or engineer if a problem with the equipment is noted.

### ● When Is A Permit Refundable? How Much?

WAC 296-46B-901(12) restricts refunds. The WAC says no refund is allowed for any permit:

- That is expired;
- Where the work has begun; or
- Where an inspection request has been made.

This can be a problem for individuals or contractors who begin the work and, for some reason, do not finish all the permitted work after obtaining the permit. It can also be a problem for those who mistakenly buy a permit in L&I's jurisdiction when the work is actually being done in a city that does their own inspections. L&I allows permit refunds based upon the intent of the WAC and good judgment that does not penalize the permit purchaser. Save yourself and L&I time and money! When buying your electrical permit, make sure you are buying it from the correct inspection jurisdiction.

A refund will be allowed for a permit where:

- The work has begun; but, an inspection request has not been made – \$25 of the permit fee will be retained to cover the cost of the refund;
- The work has begun and a first inspection request has been made – \$25 of the permit fee will be retained to cover the cost of processing the refund. If the work is in a city jurisdiction and an L&I inspector goes to the site, a dollar amount equal to the portal to portal cost of the first inspection will be withheld in addition to the \$25 processing cost; or
- The work has begun and a refund request has been made after an L&I inspection has been made – \$25 of the permit fee will be retained to cover the cost of processing the refund. If the work has been ongoing and a previous inspection(s) has been made, a dollar amount equal to the fee line(s) amount for all the work inspected, partial or complete, will be withheld in addition to the \$25 processing cost.

### ● Answer to This Month's Question of the Month:

C) 90 days. (See RCW 19.28.061(4) and RCW 19.28.211(2).



## ● This Month's Question of the Month

In other than one-family dwellings, the branch circuits for pool-associated motors shall be installed in any of the following wiring methods, except \_\_\_\_\_. A) rigid or intermediate metal conduit B) reinforced thermosetting resin conduit C) flexible metal conduit D) Type MC cable listed for the location – See the correct answer on page 2.

## ● Note From The Chief

The Governor recently issued Executive Order 10-06 that suspends all non-critical rule development and adoption through January 1, 2012. You may read the order at this link: [http://www.governor.wa.gov/execorders/eo\\_10-06.pdf](http://www.governor.wa.gov/execorders/eo_10-06.pdf).

In response to Executive Order 10-06, the Department of Labor and Industries (L&I) is in the process reviewing all rules currently in the process of rule-making to determine which rule-making should move ahead and which should be delayed for a year. Once an initial determination is made, the information will be posted on our website.

The program's electrical inspectors continue to see installations where it is obvious that the contractor and/or assigned administrator have not done their necessary quality control. Here are some of the most common serious corrections encountered in October by our inspectors:

- NEC 110.3(b) – Didn't follow the manufacturer's instructions (228 total);
- NEC 210.8(A) – Missing or inoperable Ground Fault Protection (70 total);
- NEC 314.25 – Missing cover plates (39 total);
- NEC 210.4(B) – Missing tie handles on circuit breakers supplying multi-wire circuits (32 total); and
- NEC 406.11 – Missing tamper resistant receptacles (29 total).

As I have discussed in previous articles, these types of corrections are unacceptable and are solely a result of the electrician's decisions and a lack of quality control by the contractor/administrator. Contractors and administrators, please make certain these are not the type of corrections your company is receiving.

## ● Electrical Board Position Available - Electrician

There is currently one opening for an electrician position on the Electrical Board. An applicant should be a certified electrician and not have ownership in an electrical contracting business. The position will expire July 7, 2014. Applications should be submitted to the Governor. Application information is available at:

<http://www.governor.wa.gov/boards/default.asp>

## ● Installing Optional Standby Generators – The Right Way

Installing a generator system is potentially one of the most dangerous types of electrical installations to your family, employees, and the utility's linemen. Legally and safely installing a generator system is very specialized work that requires expertise and experience. Prior to making a generator system purchase, review the special edition *Electrical Currents* – October 2007. All the information in the article is still relevant and accurate.

You can find a copy at: <http://www.lni.wa.gov/TradesLicensing/Electrical/files/currents/elc0710special%20.pdf>

Everyone interested in having a generator system installed at their house or business is strongly encouraged to work with a legally licensed electrical contractor. Before beginning the work, get written bids from two or three electrical contractors and verify that each has significant experience installing generator systems. Ask for references. Then make certain your contractor gets an electrical permit and has an inspection to verify that the work was done correctly and safely.

### Safety Tip of the Month!

**Be aware of and avoid potential arc fault hazards. Wear appropriate personal protection equipment. Look for the arc flash labeling required by NEC 110.16.**

**L&I statistics show that for a five year period, at least 30 workers were hospitalized for serious burn injuries due to arc flash/blast events. Compensation for those claims exceeded \$1.3 million and almost 1,800 days of lost work time.**

Make certain that if you are using a portable generator that you follow the manufacturer's instructions. It is imperative that you do not operate a portable generator inside a building or too close to windows or doors. Make certain the cord you use is large enough to supply the load you are powering. Protect the cord from damage and make certain your generator is capable of providing the power required for your limited load. Portable generators can only be used to power individual plug-in type appliances (e.g. refrigerator, individual heater, etc.). If you fail to properly install and use a portable generator, you and your family are at significant risk from asphyxiation, electrocution, and structural fire.

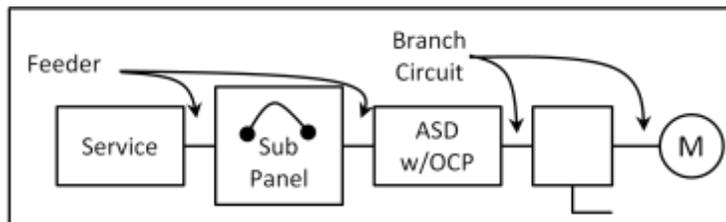
If you have installed a generator system, this year, without a permit and inspection, L&I will not assess any penalties if you proactively get the required permit and inspection before January 30, 2011. Protect your loved ones!

### ● NEC 430, Part X – Adjustable Speed Drive Systems

Part X was added in the 2005 NEC, but some installers and designers seem to be unaware of its requirements, especially in the area of overcurrent protection. One of the first things to determine is if the adjustable speed drive (ASD) contains overcurrent protection. This is a key question that must be answered before sizing conductors and overcurrent protection and determining what part of the circuit is or is not a feeder. By definition, NEC 430.2, an ASD includes a power converter. This is important point when sizing conductors to the ASD.

First, let's look at the definition of overcurrent protection in NEC 240.2. An overcurrent device is any device that, "when interrupting currents in its current-limiting range, reduces the current flowing in the faulted circuit to a magnitude substantially less than that obtainable in the same circuit if the device were replaced with a solid conductor having comparable impedance." This broad definition includes the normal overcurrent devices, fuses, circuit breakers, and thermal overloads; but, it can also include devices like an ASD where the current is limited, by any means. Most ASDs contain some type of overcurrent protection.

Second, let's look at the definition of a feeder in NEC 100. A feeder includes "all circuit conductors between the...power source and the final branch-circuit overcurrent device." If the ASD contains any type of overcurrent protection, the circuit from the power supply to the ASD is a feeder(s) – see the diagram. If the disconnecting means, shown in the diagram, contains fuses or is a circuit breaker, the circuit between the ASD and the disconnecting means will also be considered a feeder. For determining fees only, L&I does not consider a circuit a feeder until the last overcurrent protection exceeds 30 A.



NEC 430.122(A) requires the minimum ampacity of the branch/feeder conductors from the sub-panel to the ASD to be not less than 125% of the rated input of the ASD. Paragraph (B) says that if the ASD utilizes a bypass device – to allow full-speed operation – the ampacity of the ASD's supply conductors must be the larger of:

- 125% of the rated input to the power conversion equipment; or
- 125% of the motor full-load current rating as determined by NEC 430.6.

Per NEC 430.124, overload protection of the motor(s) supplied by an ASD must meet the following conditions:

- For an ASD w/o a bypass, it must be sized per the label on the ASD – additional protection is not required;
- For an ASD with a bypass, it must be sized per NEC 430, Part III in the bypass circuit; or
- For an ASD supplying multiple motors, it must be sized per NEC 430, Part III

Per NEC 430.128, the ASD's disconnecting means may be in the ASD or the incoming circuit and must be rated not less than 115% of the rated input current of the ASD.

### ● Answer to This Month's Question of the Month

C) flexible metal conduit. (See NEC 680.21(A)).



## ● This Month's Question of the Month

Who is responsible for ensuring the total quality of an electrical installation? A) Inspector B) Electrical Contractor C) Electrician – See the correct answer on page 2.

## ● Note From The Chief

Electrical inspectors are seeing more jobs – from a very small minority of electrical contractors – where the electrical contractor has a significant number of corrections or has missed one or two significant problems with their electrical installation. Last year, only 5% of all active electrical contractors received 40% of all corrections issued. This very small group of contractors negatively affects the ability of inspectors to quickly get to the inspections of other contractors' work. All electrical contractors and their assigned Administrator or Master Electrician are expected to do the quality control necessary to ensure that their job is ready for inspection. Ready for inspection means ready to be passed by the inspector. Inspectors are not expected to do the quality control for that small number of poorly performing contractors.

When inspectors find jobs where critical elements are incorrect (e.g. missing service bond connections, missing or inoperable GFCIs or AFCIs, etc,) or there are, in general, a significant number of corrections, the inspector may declare the job not ready for inspection. When that happens, the inspector will stop the inspection process and assess a trip fee for the re-inspection required because the contractor, or Administrator, or Master Electrician did not verify the job was ready for inspection. The contractor must then pay the assessed trip fee, make the corrections noted, and do the required quality assurance before requesting a re-inspection. When the inspector returns, the remainder of the job will be inspected, including the repairs for the corrections previously noted.

The job should be ready to be passed each time an inspection request is made.

## ● Solar Photovoltaic Installations

The PV industry has been around for several decades and has been a very innovative industry. The first National Electrical Code article dedicated to PV systems was included in the 1984 NEC.

One of the biggest changes has been the recent rapid development of building integrated PV systems (BIPV). When a PV array or panel is a structural component of the outside shell of a building, it is considered to be a building integrated system. In the last few years, roofs, windows, and facades have been designed equally as a finished surface or structural component of a building and as a PV power source – building integrated system. Oftentimes, these types of PV panels and arrays cannot easily be identified as a part of a PV system. Building integrated systems can range from small residential to very large commercial installations.

Because of the cross-trades aspect of building integrated systems, some people are confused about who can and cannot install them. Think of building integrated PV systems in simplistic terms. There is a mechanical aspect and an electrical aspect. Because one aspect does not prevail over the other, the mechanical aspect must be done by a general contractor registered under RCW 18.27 and the electrical aspect must be done by an electrical contractor licensed under RCW 19.28. This might require one contractor or two depending upon how the contractor is licensed and/or registered. If the electrical contractor is also a registered general contractor, the electrical contractor can do the entire installation.

If one contractor is involved, that contractor may use a crew split between roofers and certified electricians. Because there are worker certification requirements for electricians and none for roofers, the contractor might decide to only use certified electricians to make the complete installation. However, this is not likely because of the different skill levels involved and the differential in labor costs between the two trades. When building

### Safety Tip of the Month!

**Before the flood**, go to the L&I Electrical website and click on Home and Business Owner Basics to get information about what to do before and after a flood that is critical to you and your family's safety.

<http://www.lni.wa.gov/tradeslicensing/electrical/>

If your house or building floods walk around and see if any part of your electrical system was submerged. Replace or repair all flood damaged wiring and equipment and get it inspected before re-energizing your system.

integrated systems are being installed, the electrical contractor must obtain the electrical permit before the PV arrays/panels are installed. The electrical contractor must do all of the electrical installation (e.g. wiring support, connections, etc.).

When the installation is non-electrical (e.g. roof brackets or stands that are not used as a grounding path), the work can be done by either a registered general contractor or a licensed electrical contractor. The electrical contractor, using certified electricians or properly certified trainees, must do the installation of all panels (except for building integrated as described above), wiring and other equipment that is used, in any way, to create, carry, or use electrical current.

### ● Fee Training Series – Miscellaneous

This is the seventh in a series of articles on selecting the appropriate permit fees for your work. This article will cover WAC 296-46B-906(7), (8), (9), (10), (11), (12), (13), (14), and (15).

Because of its limited use, Paragraph (6) will not be covered.

Paragraph (7) covers the various trip fees. The first fee item is requests by owners to inspect existing installations. The basic fee is \$86.60 and allows up to one hour of inspection time. If the inspection takes more than one hour, the inspector will add a progress inspection fee. The additional progress fee is \$43.10 for each additional or part of ½ hour. This fee item can only be used by the property owner (i.e. no contractors, real estate agents, etc.). The remaining trip fees are related to penalties and will be assessed by the inspector as appropriate.

Paragraph (8) covers progress inspection fees. This fee item is only used by covered in the basic fee. The fee can only be used by the inspector.

Paragraph (9) is for plan review. This fee is only used by the plans examiner and is in addition to the normal inspection fee. This fee must be paid in full before the approved plans will be returned to the submitter.

Paragraph (10) covers travel expenses for out of state inspections. Travel costs will be based upon the time required by the inspector and travel expenses as allowed by Washington state per diem rate.

Paragraph (11) is used as a miscellaneous category for any item not covered by another fee line item. It is a portal to portal hourly rate per hour or part of an hour. The hourly rate is \$86.60. Pre-scheduled inspections on weekends or after normal working hours must include portal-to-portal hours, adjusted for overtime when necessary, plus the regular line-item fee. This fee will be assessed by the inspector.

Paragraph (12) covers the fee for processing a variance application. This fee is due when the variance is submitted and is non-refundable.

Paragraph (13) covers marking of industrial utilization equipment by an inspector. This fee item is no longer relevant because the department no longer marks industrial equipment. It will be removed from the fee schedule and should not be used.

Paragraph (14) covers the purchase and inspection of Class B labels. Each book of twenty labels costs \$237.70 and is not refundable. If re-inspection of a Class B label is necessary, a basic fee of \$43.10 will be assessed by the inspector. The re-inspection includes the time from the previous inspection to the end of the re-inspection. If ½ hour is exceeded, the inspector will assess additional progress inspection fees.

Paragraph (15) covers the purchase of Provisional Permit labels. Each book of twenty labels costs \$237.70 and is not refundable.

This is the final article in this series. Use the previous articles to review your permit fees. Remember that articles written before October 2010 used the previous fee schedule. When reviewing a previous article or buying a new permit, you should use the current fee schedule that became effective October 1<sup>st</sup>.

### ● Answer to This Month's Question of the Month

B) and C) Electrical Contractor and the Electrician. (The entities that are doing the installation have responsibility for the overall job. The inspector is responsible for a spot check/audit of the overall installation).



## ● This Month's Question of the Month

What is the best way to communicate inspection request details to the inspector? A) Call the inspector, B) E-mail, C) Send a 255 character comment in an online inspection request, D) Leave a phone message – See the correct answer on page 2.

## ● Note From The Chief

It is time for an update after the spring layoff of inspectors. We are doing our best to respond quickly to inspection requests and maintain a high level of compliance enforcement with the underground economy and contractors getting a competitive advantage by not following the law.

Even with the larger areas that each of our inspectors is required to cover, we are getting to 89% of all inspections within 48 hours of the inspection request. Over 85% of all our compliance activity is related to unlicensed electrical contracting, uncertified electricians, and failure to buy a permit and get inspection.

We have been and will continue using a “plan, do, check, and adjust” philosophy to find the most efficient and effective ways to provide the quality of service our customers expect and need.

## ● Air Compressor Marking Requirements

This is a follow-up to an article published in May 2009 and will further clarify the options available when an inspector encounters an unlisted air compressor. But, because compressors are often manufactured in multiple configurations (e.g. tank mounted, skid mounted, and with multiple accessories, etc.) only a very few manufacturers use UL 1450 and list their equipment as a unit.

Listing is always the preferred method of documentation that the equipment is appropriate. If the compressor is not listed to UL 1450 by an approved electrical testing laboratory, the inspector has three options available:

1. The equipment may be approved by field evaluation;
2. If all components are listed, the inspector can inspect according to the NEC; or
3. The installer/owner may request a site specific variance request. The request must prove that all of the electrical components have been manufactured and installed in accordance with applicable standards.

## ● New Fees Effective October 1, 2010

Do not forget to update your WAC book with the new permit/license fees. New WACs will not be printed. Fourteen insert pages (seven when printed double-sided) with all the new fees are available as direct replacements for the fee pages in the last (October 31, 2009-yellow cover) printing at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/files/WAC-RCW/Fees100110-replacement.pdf>

## ● Class A Permit Exempt List – Can You Replace More Than One Of Those Contactors?

The RCW definition of Class A, permit exempt, work has been in place since the 2003 legislative session. Many installers seem unaware that the items that are exempt are limited to only one of each item. The singular language was put into place to limit an installer who might attempt to do a large scale replacement without an inspection (e.g. re-fixture a complete house, replace all the controls on a motor control system, etc.). The definition says that replacement is limited to “a” contactor, relay, etc. This means a single contactor, relay, etc. on a single jobsite each day. If you are replacing multiples of a component or equipment on the Class A basic electrical work list, an electrical permit is required. However, because of the lack of understanding of this requirement, inspectors will use discretion when enforcing the permitting requirement at this time.

During the current rule making process, the program is reviewing the Class B rule to allow an electrical contractor to replace multiple Class A items by using a Class B label. All proposals will be reviewed by the Technical Advisory Committee (TAC) and the Electrical Board.

### Safety Tip of the Month!

Maintain & update your electrical systems.

Most electrical fires result from problems with "fixed wiring" such as faulty electrical outlets and old wiring (U.S. Fire Administration).

Get a permit and electrical inspection for all new and changed wiring.

### ● Fee Training Series – Miscellaneous

This is the fifth in a series of articles on selecting the appropriate permit fees for your work. This article will cover WAC 296-46B-906(5), Miscellaneous – commercial/industrial and residential. Most of the items in “Miscellaneous” are very straight forward; but, others require some explanation.

You will see “inspected at the same time” in several parts of the “Miscellaneous” section. It means all work must be ready so the inspector can complete the inspection in one single ½ hour visit. For example, if two thermostats are to be installed and an inspection request is made when only one is ready for inspection, the installer does not get to use the reduced fee of \$13.40 for the second thermostat. Each one will cost \$43.10. This logic can be applied to the other items where a reduced fee is allowed for inspection of multiple items made at the same time.

Class 2 or 3 low voltage or telecommunications systems’ fees are calculated on a square foot basis similar to a new residence (see *Electrical Currents*, May 2010 edition). The first 2,500 square feet is \$50.00 and each additional or part of 2,500 square feet is \$13.40. For example, if the low voltage system is in a 7,600 square foot building, the total fee is \$90.20 (\$50.00 for the 1<sup>st</sup> 2,500 square feet plus 3 X \$13.40 for the remaining 5,100 square feet).

The fees line for yard pole, pedestal, or other meter loops is only for meter installations remote from the service location. If the meter installation is inspected at the same time as the permanent service or with another part of the electrical installation, the fee for the meter is \$36.10. If it is inspected by itself, the fee is \$57.10.

When you are calculating the fees for a permanently installed generator, you must use the fees in the appropriate residential (section (1)(b)) or the commercial new/altered service or feeder (section (2)(a) section. See the July 2010, *Electrical Currents* for calculation fees for how to make those calculations.

The fee for inspecting permanently installed transfer equipment for a single portable generator connection is \$79.40 is in addition to any other required fees. This fee applies to both residential and commercial installations. For portable generators and equipment, the fees for temporary services/feeders in section (3) should be used.

Annual permits are allowed for commercial and industrial facilities. Annual permits can only be used by the facility owner who has qualified maintenance electricians or an electrical or telecommunication contractor that has an annual maintenance contract for the facility.

- See WAC 296-46B-901(14) for a description of the work covered by an annual electrical permit. For electrical work, the fee is based upon the number of electricians available to do electrical work. Supervisors are counted as an electrician if they participate in doing the work.
- See WAC 296-46B-901(13) for more information about annual telecommunication permits. Annual telecommunication permits can only be used for telecommunication circuits. For telecommunication work, the fee is based upon the portal-to-portal hours necessary to complete the inspections.

The fee for “ditch cover inspections only” is required whenever the inspection is only for ditch cover. This fee is in addition to other required fees. For example, if you are installing a new 200 ampere underground feeder to a second building at a residence and need a twenty minute ditch cover inspection, between the two buildings, before the feeder work is complete the total fee, for the job, is \$136.50 (\$93.40 for the 200 ampere feeder plus \$43.10 for the separate ditch inspection). If the underground portion of the feeder is inspected with the rest of the feeder, the underground only portion of the fee is not required and the total fee for the feeder would be \$93.40. The fee, per half-hour, for ditch cover inspections can also be used when an underground conduit or wiring is installed for future use and is not being connected to an active electrical system.

With all fees, it is important to remember that if the allowed number of progress inspections is exceeded, additional progress inspection fees will be assessed. Remember, inspections are counted in ½ hour increments (e.g. 70 minutes equal 3 inspections for fee purposes). See the May 2010, *Electrical Currents*.

### ● Answer to This Month’s Question of the Month:

C) Send a 255 character comment in an online inspection request. (Many inspectors work directly from the field and inspections are often shifted from one inspector to another. The online comment is the preferred method of communication).



### ● This Month's Question of the Month

Conductors installed on the outside of buildings where AC systems operate at less than 50 volts are required to be grounded when they are run as \_\_\_\_\_ conductors. A) overhead, B) underground, C) IGS, D) all of the above – See the correct answer on page 2.

### Safety Tip of the Month!

Stay in control!

Do not use a trigger hold button on a power tool, ever.

### ● Note From The Chief

Your opportunity to submit WAC rule proposals is quickly approaching. The proposal period is from September 7<sup>th</sup> through October 8<sup>th</sup>. For details, go to the *What's New* link, then the *Electrical Rule Development* link on the electrical Web site at:

<http://www.lni.wa.gov/tradeslicensing/electrical/>

The program continues to try to reduce the negative impacts of the underground economy and contractors who attempt to gain a competitive advantage by not following the law. In July, 269 or 86% of the citations and warnings issued were for no electrical contractor license, no electrician certificate, failure to buy and electrical permit, or an associated issue. All these violations negatively impacted contractors who follow the law and potentially were installed in an unsafe manner that would place the consumer at risk of fire or shock hazards.

Help us protect the general public and your business. Work with our ECORE compliance team and inspectors to ensure installations are made according to code by qualified contractors and electricians. The ECORE team finds contractors and electricians who do not follow the law and compete with an unfair advantage. If you want to do your part and protect your interests by referring illegal activity, you may contact the ECORE team at:

|               |                |                       |                       |
|---------------|----------------|-----------------------|-----------------------|
| Tony Bierward | (360) 902-4987 | (360) 471-0588 (cell) | Southwest WA          |
| Phil Jordan   | (509) 324-2542 | (360) 471-0691 (cell) | Spokane – Eastern WA  |
| Jack Oxford   | (206) 835-1130 | (360) 471-0746 (cell) | King County and NW WA |

### ● New Electrical Fees

Effective October 1, 2010, Electrical permit and licensing fees will be increasing. We recently completed the public comment and hearings that are required before making changes to the WAC. Very few comments were received. There were more comments in support of the increase than against it. While we recognize that any increase in these tough economic times is difficult, we believe this increase is necessary to maintain the level of service we are now providing.

As you know, we have reduced our staffing by over 30% in the past year and made other cost saving changes. The staff reductions have made it much more difficult to cover the state's inspection workload effectively. In remote areas, especially, we are unable to deliver inspections as quickly as in the past. A further reduction in our ability to respond quickly to inspection requests would have an unacceptable impact on the ability of our customers to get their projects completed. Hopefully, this increase will allow us to continue to provide the level of service that our customers need. The new fees are available on the electrical Web site at:

<http://www.lni.wa.gov/rules/AO10/21/1021Proposal.pdf>

### ● Electrical Permit Refund Requests – When Are They Allowed?

Make certain that you are buying your electrical permit from the correct jurisdiction. All electrical inspection authorities are routinely asked to refund permit fees for permits that were purchased from the wrong jurisdiction. WAC 296-46B-901(12) limits refunds for electrical permits. Refunds from L&I are not allowed for:

- Expired electrical permits
- Electrical permits where the electrical installation has begun; or
- Any electrical permit where an electrical inspection or electrical inspection request has been made.

Don't spend your time and money buying permits that are unnecessary. Before buying a permit, make certain that you will actually do the work and that you buy the permit from the jurisdiction where the work will be done.

### ● Fire System Certification Requirements

It has come to L&I's attention that some local fire jurisdictions are requiring NICET II certification for designing, installing, testing, and maintaining fire detection and sprinkler systems. The electrician's law, RCW 19.28.211(4) specifically gives an appropriately certified electrician the right to work within their defined scope without additional proof of competency, permit, or fee. Local jurisdictions cannot add requirements for electrical work.

Local jurisdictions may have additional requirements for any work that is not electrical in nature (e.g. electrical – installing or removing devices/wiring/equipment, connecting or disconnecting wiring, etc.).

### ● Fee Training Series – Temporary Services, Concert And Stage Productions, Irrigation Systems

This is the fourth in a series of articles on selecting the appropriate permit fees for your work. This article will cover WAC 296-46B-906(3), Temporary construction services stage or concert productions and (4) Irrigation machines, pumps, and equipment.

**Temporary systems** – There are restrictions on when an electrical installation is considered to be temporary. WAC 296-46B-590 restricts temporary construction installations to being used only for construction purposes. The temporary construction service must be disconnected when the permanent service is connected.

Fees are calculated based upon the service or feeder size. For the first service or feeder, you should use the Service/Feeder column in WAC 296-46B-906(3) to calculate the permit cost for the first service/feeder. For each additional feeder, use the Additional Feeder column. For example: If your temporary system has a 200 ampere feeder and two 100 ampere feeders, the total permit fee is \$113.60 (i.e. 200 ampere feeder is \$64.40 plus 2 – 100 ampere feeders at \$24.60 each). All branch circuits are included in the service/feeder fee.

If your temporary stage or concert inspection is outside normal business hours, a portal-to portal fee of \$76.70 per hour will be assessed. Notice of the off-hours inspection request must be made in time to allow the supervisor time to schedule the inspection or a callback minimum of three hours will be assessed. The callback minimum is included in the portal-to-portal rate. To avoid the callback minimum, you must request your off-hours inspection no later than one working day prior to the day you need the inspection. The final fee is the normal fee, the portal-to-portal fee, or if applicable, the callback minimum, whichever is greater.

Using the example above, for an evening concert inspection that takes two hours, portal-to portal and you requested the inspection more than one working day prior to the inspection, the fee would be \$153.40 (i.e. 2 hours portal-to-portal – 2 X \$76.70), not the \$113.60 calculated fee. If you request the inspection less than one working day prior to the inspection, the fee would be \$230.10 (i.e. 3 hours callback minimum – 3 X \$76.70) even though the portal-to-portal time was only two hours.

**Irrigation machines, pumps, and equipment** – You should use paragraph (4) to calculate the permit fees for irrigation machines that use sprinkler towers. The service or feeder(s) supplying the tower is calculated using paragraph (2) Commercial/Industrial as described in the August *Electrical Currents*. In addition to the service/feeder(s) fee, each tower is charged separately. If the towers are inspected at the same time as the service/feeder(s), the fee is \$5.50 per tower. If a tower(s) is inspected separately from the service/feeder(s), the fee for 1-6 towers is \$76.70 and each additional tower is \$5.50.

For example: You install a 200 ampere feeder from an existing service. There is a sub-feeder supplying a 40 ampere pump and the irrigation system consists of fifteen towers. If the complete installation is inspected at the same time, the total fee is \$233.80 (i.e. 200 ampere feeder - \$100.70 plus 40 ampere feeder - \$50.60) plus 15 towers at \$5.50 each - \$82.50).

If the towers are inspected separately from the feeders, the total fee is \$277.50 (i.e. 200 ampere feeder - \$100.70 plus 40 ampere pump feeder - \$50.60 plus separate inspection of 1-6 towers at \$76.70 plus 9 additional towers at \$5.50 each - \$49.50).

### ● Answer to This Month's Question of the Month:

A) overhead (see NEC 250.20).



## ● This Month's Question of the Month

For a photovoltaic power source with a photovoltaic system voltage over 50 volts the DC circuit system grounding connection shall be made at \_\_\_\_\_ on the photovoltaic output circuit. A) the source end, B) the load end, C) any single point, D) the grounding terminal – See the correct answer on page 2.

### Safety Tip of the Month!

Except in an extreme situation – DO NOT work on energized electrical circuits!

Lock them out!

Tag them out!

Check for Power!

## ● Note From The Chief

We are getting closer to seeing the publication of the 2011 National Electrical Code. We will be opening the electrical WAC for review and proposals to adopt the new NEC and make other changes. Proposals from external customers will be accepted from September 7<sup>th</sup> through October 8<sup>th</sup>. As in the past, the Technical Advisory Committee (TAC) will be convened to review all proposals and provide a recommendation to the department. The TAC is a large committee representative of a general cross section of the electrical industry. The TAC will meet in late November. Public hearings will occur in spring 2011. The Electrical Board will also review and make a recommendation to the department. Because of the need to implement 2010 legislative changes, the rule must be completed and effective on July 1, 2011.

A special edition of the *Electrical Currents* newsletter will be published to explain the WAC process, provide a proposal form, and advertise for membership on the TAC committee. To receive the first update and to stay current, be sure you are on the program's Electrical E-mail List. To join the list, go to:

<http://www.lni.wa.gov/Main/Listservs/Electrical.asp>

All members of the electrical industry in Washington are encouraged to become involved in the rule revision process. If you have suggestions for change, you should submit them as described in the September Special Edition *Electrical Currents*. If you have some time, put your name in for TAC membership and provide your input.

## ● Electric Vehicle Charging

More electric cars will be here soon. Electrical contractors, electricians, and electrical Inspectors will soon be seeing an increased number of charging stations for those vehicles. Charging will range from a simple outdoor receptacle to more complex credit card actuated charging equipment. The scope in NEC Article 625 includes the conductors and equipment external to an electric vehicle that connect the vehicle, by conductive or inductive means, to a supply of electricity and the installation of equipment and devices related to electric vehicle charging.

Here are some essential things to consider when installing or inspecting a charging station or receptacle:

- The charging equipment must be listed or field evaluated by an approved electrical testing laboratory. At this time, we are not aware of any small vehicle charging units that are listed.
- If the charging supply is 125 volts, 1Ø and 15 or 20 amperes, a cord and plug connection is acceptable.
- Load calculations must consider the vehicle charging to be continuous duty. There is no de-rating allowed. Be wary of simply adding a receptacle on an existing circuit. You must consider the existing load and the vehicle charging load for the circuit.
- An interlock to prevent the charging receptacle from being energized when the vehicle is disconnected is not required for 125 volts, single phase, 15 or 20 ampere receptacles.
- Vehicle charging in outdoor locations must not be less than 2' or more than 4' above grade.
- The 2011 NEC will have some changes to the current article.

## ● Fee Training Series – Commercial And Industrial

This is the fourth in a series of articles on selecting the appropriate permit fees for your work. WAC 296-46B-906(2), Commercial/Industrial, is separated into 4 sections. When determining permit fees:

- Paragraph (a) is used for new services and feeders, including their branch circuits.
- Paragraph (b) is used for altered services and feeders, not including any branch circuits.

- Paragraph (c) is used for branch circuits only.
- Paragraph (d) is used only for over 600 volt installations.

For large commercial and industrial projects, “inspected at the same time” means that services, feeders, and their branch circuits may be inspected on a progress basis for the project. There is no definition for “large” in the WAC or RCW. For the purposes of calculating fees, all new service and/or feeder projects may use paragraph (a).

The total fee must not be less than the number of progress inspections units (i.e. one-half hour increments) times the progress inspection fee (\$38.20) in subsection (8) of the fee schedule. For example, if a 100 ampere feeder or service is installed at the basic permit fee of \$82.70, two progress inspections are allowed. The third progress inspection will be assessed an additional fee of \$38.20 for a total fee of \$120.90.

All new service fees are calculated using the “Service/Feeder” column. If there is no new service, the largest new feeder uses that column. For any additional feeder use the “Additional Feeder” column. For example, if you are installing a 600 ampere new service, two 200 ampere feeders, and one 300 ampere feeder, the total permit fee will be \$431.40 (600 ampere service - \$225.90 plus two 200 ampere feeders – 2 X \$64.40 = \$128.80, plus one 300 ampere feeder - \$76.70).

The fees for a new service or new feeder include all branch circuits being supplied directly by the service or feeders. If the branch circuits are not supplied directly, you must use paragraph (2)(c) to calculate the branch circuit fees. If there is more than one new service, all the service fees must be calculated using the “Service/Feeder” column. For example, if you are installing a 1,200 ampere service and a 100 ampere service, the total permit fee will be \$471.70 (1,200 ampere service - \$389.00 plus 100 ampere service - \$82.70).

The fees in paragraph (2)(b)(i) are used to calculate the fees for altered services and feeders. These fees do not include any branch circuits. They are intended only for the repair/replacement of damaged conductors or equipment. Paragraph (2)(b) is normally used only when repairs are necessary due to damage from storms, etc.

Paragraph (2)(b)(ii) fees are used to calculate the fees when the damage is limited to the maintenance or repair of a meter, overhead mast, or service lateral riser. Paragraph (2)(b)(ii) must not be used if the service entrance conductors or panelboard need repair or replacement. If the service entrance conductors or panelboard need repair, you should use the fees in paragraph (2)(b)(i).

For calculating the fees for branch circuits not included in paragraph (2)(a), you should use the fees in paragraph (2)(c). Branch circuit fees are calculated per panelboard. The total cost of the circuit alterations in a panel must not exceed the cost of a new feeder of the same rating in paragraph (2)(a). For example, if you are adding 20 branch circuits to a 100 ampere panelboard and 3 circuits to a 200 ampere panelboard, the total fee will be \$147.70

- The fee for the 20 circuits in the 100 ampere panelboard paragraph (2)(a) is \$82.70, the paragraph (2)(c) calculated fee is \$64.40 plus \$82.50 – additional 15 circuits or \$146.90. The fee in paragraph (2)(a) is smaller and is the fee that should be used - \$82.70.
- The fee for the three circuits in the 200 ampere panelboard paragraph (2)(a) is \$100.70, the paragraph (2)(c) calculated fee is \$64.40 for the first five circuits. The fee in paragraph (2)(c) is smaller and is the fee that should be used - \$64.40).

Paragraph (d) is a \$64.40 surcharge that should be added to any permit where a service, feeder, or circuit is being permitted that is over 600 volts. There is only one surcharge per permit. There is no additional surcharge for each service, feeder, or circuit.

Remember that, for any permit, the total permit fee must equal or exceed the progress inspection rate (i.e. each one-half hour of inspection times \$38.20).

### ● Answer to This Month’s Question of the Month:

C) any single point (see NEC 690.42).



## SPECIAL EDITION

### ● New Electrical Code And Other Possible WAC Changes

The 2011 version of the National Electrical Code (NEC) will be published this month. This rule development process will evaluate the 2011 NEC for appropriateness with Washington's needs and for economic impacts before implementing the 2011 NEC. This rule development process will include possible modification to all sections of WAC 296-46B.

### ● The Department Is Seeking Stakeholder Input For Proposed Rule Changes

Any stakeholder in the electrical industry may make proposals for additions and/or revisions to the Washington Administrative Code WAC 296-46B – Electrical Safety Standards, Administration, and Installation electrical rules. Proposals, from stakeholders, may be submitted from September 7, 2010 through October 8, 2010. Proposal submission guidelines are detailed below.

Rules are developed to aid both stakeholders and the department in clarification or enforcement of the intent of the electrical statute. Technical changes require evidence of a specific problem and substantiation that the proposal will provide a solution for that problem.

The department is responsible and has final authority for developing all rules. The department will act as the correlating body during the rule development process and may at any time promote rule change as necessary to accommodate statutory change or department policies or procedures.

### ● Proposals For Change

The form shown in this edition must be used to submit rule proposals for the 2011 revision cycle. An electronic Word version of the form is available on our Rule Development page at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/LawRulePol/RuleDev/default.asp>

Industry proposals **must be received from 12:01 AM September 7, 2010 through 11:59 PM October 8, 2010**. The submitter may submit a proposal(s) by:

- o Sending the proposal(s) as an email attachment to <mailto:ElectricalWAC@lni.wa.gov>; or
- o Mailing a compact disc containing the proposal(s) to Chief Electrical Inspector, P.O. Box 44460, Olympia, WA, 98504-4460.

**Proposals will not be accepted before or after these dates. All proposals to WAC 296-46B must be made electronically** using the form supplied by the department. All proposals must clearly identify original language as "new text." Proposed revisions should include the relevant existing text and should use the legislative format (i.e. Use underscore (or underlining) to denote wording to be inserted (e.g. inserted wording) and strike-through to denote wording to be deleted (e.g. ~~deleted wording~~)). **Proposals not submitted according to these instructions will be rejected.**

### ● Keep Informed

There will not be a specific mailing list for this WAC process. Special WAC update postings will be maintained using the Electrical Program's *Electrical Email List*, internet website, and *Electrical Currents* newsletter.

The best way to stay informed of the WAC process and other electrical issues is to join the *Electrical Email List* at:

<http://www.lni.wa.gov/Main/Listservs/Electrical.asp>

### ● Technical Advisory Committee (TAC)

The TAC process has proven to be very valuable in past years. The department will again appoint an advisory General TAC made up of experts and interest group representatives to review and make **recommendations** on proposals from the electrical industry.

**Persons interested in becoming TAC members** must submit a letter of interest for specific positions to the Chief Electrical Inspector, P.O. Box 44460, Olympia, WA, 98504-4460 **to be received from September 7, 2010 through October 8, 2010**. The letter should show constituency support for the prospective member. All applications will be evaluated to determine that the applicant meets the requirements for the position.

In order to keep the size of the TAC to an efficient and effective number, the committee will be limited to 30 voting members. The TAC makeup will be based on an equitable distribution relative to proportion of involvement within the electrical industry in Washington. TAC membership provides an opportunity for everyone interested in the Electrical Program's WAC development to participate in the process.

If necessary, each successful candidate may have an alternate attend the TAC meeting. There will be no formal alternate assigned by the department. Any TAC member that is absent must notify the Chief Electrical Inspector of the alternate's name one week prior to the TAC meeting. Failure to make the required notification will result in the position being vacant during the meeting.

### ● The TAC – Process

The TAC will make recommendations on industry proposals and identify proposals that may have an economic impact on other specialties, small businesses, construction costs, or the cost of enforcement. Members who know they will be absent from a TAC meeting should make every effort to send an alternate. The TAC must review and evaluate proposals based on the need:

- o To address a critical life/safety need;
- o To address a specific state policy/statute;
- o To maintain a fair competitive environment;
- o To address a unique character of the State; or
- o To correct errors and omissions.

The TAC will operate on a majority basis. A majority vote in support of a motion, of members in attendance, will be considered as significant support for the motion made on a specific proposal. The TAC can propose amended language to a proposal. All voting members share an equal vote. The department will consider all TAC recommendations.

### ● 2011 WAC Revision Process – Proposed Sequence Of Events

- o **September 2010** – File CR 101 – pre-proposal statement of inquiry
- o **September 7 through October 8, 2010** – Accept proposals from stakeholders to: amend or add to the existing WAC
- o **September 7 through October 8, 2010** – Accept applications for TAC
- o **November 29, 2010 (possible 2<sup>nd</sup> day)** –TAC meeting, Tukwila L&I office
- o **Spring 2011** – File CR 102 –rule filing (opens the official required public comment period)
- o **Spring 2011** – Public hearing(s) & Electrical Board review
- o **July 1, 2011** – Effective rule

### ● General TAC – Membership

#### Chairperson– Chief Electrical Inspector (non voting)

|   |   |    |                               |
|---|---|----|-------------------------------|
| 2 | Electrical Board Members (non voting)         | 1  | WA Manufacturing Business     |
| 1 | Training School/Continuing Education Provider | 1  | Electrical Engineer           |
| 1 | JATC  | 1  | Electrical Testing Laboratory |
| 1 | Electrical Manufacturer Representative        | 1  | Utility                       |
| 1 | L&I Inspection (Supervisor & Inspector)       | 10 | Electrical Contractors        |
| 1 | City Regulator (Supervisor & Inspector)       | 10 | Electricians                  |
| 1 | Plumber (Contractor or Worker)                |    |                               |

**Notes:**

- o Contractor positions must be filled by a licensed electrical/telecommunications contractor or representative of an electrical contractors' association in Washington representing that specialty.
- o Electrician positions must be filled by a certified electrician who is not an owner in an electrical contracting business.
- o The AD HOC contractor and electrician positions must be filled by a specialty not otherwise represented on the TAC.
- o The plumbing position must be filled by a registered general or plumbing contractor or a representative of a plumber contractor's association in Washington or certified journeyman plumber.

| <b>Methodology for Determining the Number of Electrical Contractor and Electrician Members</b> |  |                          |                         |                          |                              |                         |
|--|--|--------------------------|-------------------------|--------------------------|------------------------------|-------------------------|
| <b>Active Licenses &amp; Certificates</b>  | <b># of Contractors</b>  | <b>% of All Licenses</b> | <b># of TAC Members</b> | <b># of Electricians</b> | <b>% of All Certificates</b> | <b># of TAC Members</b> |
| 1  | 2,740  | 51%                      | 5                       | 15,620                   | 58%                          | 6                       |
| 2  | 314  | 6%                       | 0                       | 2,352                    | 9%                           | 1                       |
| 3  | 124  | 2%                       | 0                       | 488                      | 2%                           | 0                       |
| 03A  | 63   | 1%                       | 0                       | 378                      | 1%                           | 0                       |
| 4  | 87   | 2%                       | 0                       | 232                      | 1%                           | 0                       |
| 6  | 557  | 10%                      | 1                       | 2,370                    | 9%                           | 1                       |
| 06A  | 810  | 15%                      | 2                       | 3,475                    | 13%                          | 1                       |
| 06B  | 12   | 0%                       | 0                       | 69                       | 0%                           | 0                       |
| 7  | 108  | 2%                       | 0                       | 1,329                    | 5%                           | 0                       |
| 07A  | 16   | 0%                       | 0                       | 76                       | 0%                           | 0                       |
| 07B  | 76   | 1%                       | 0                       | 377                      | 1%                           | 0                       |
| 07C  | 0  | 0%                       | 0                       | 13                       | 0%                           | 0                       |
| 07D  | 39   | 1%                       | 0                       | 188                      | 1%                           | 0                       |
| 07E  | 5  | 0%                       | 0                       | 110                      | 0%                           | 0                       |
| 9  | 383  | 7%                       | 0                       |                          | 0%                           | 0                       |
| 10   | 25   | 0%                       | 0                       | 52                       | 0%                           | 0                       |
| <b>Ad Hoc Group</b>  | 1,252  | 23%                      | 2                       | 3,312                    | 12%                          | 1                       |
| <b>Total</b>   | <b>5,359</b>   |                          | <b>10</b>               | <b>27,129</b>            |                              | <b>10</b>               |
| <b>Notes:</b>  | <9% of Licenses/Certificates joins the Ad Hoc group  |                          |                         |                          |                              |                         |
|  | The Ad Hoc group will be filled on an equitable base with an emphasis on representation closely following the % of licenses, with an effort to fairly represent the different specialties. |                          |                         |                          |                              |                         |
|  | Unfilled positions will remain vacant  |                          |                         |                          |                              |                         |

# PROPOSAL FORM for 2011 WAC 296-46B Rule Changes

**Mail CD to:**

Chief Electrical Inspector  
Department of Labor and Industries  
Electrical Section  
PO Box 44460  
Olympia, WA 98504-4460

**Email to:**

<mailto:ElectricalWAC@lni.wa.gov>

as an attachment

**FOR L&I USE ONLY**

Specific Rule #:

Date Received:

**NOTES:**

1. All proposals must be **received from 12:01 AM September 7 through 11:59 PM October 8, 2010.**
2. Limit each proposal to a single rule section. Use a separate copy for each proposal.
3. **ENTER TEXT ONLY IN THE UNSHADED SPACES ON THIS DOCUMENT – SAVE AS A NEW FILENAME BEFORE RETURNING**

**Date submitted:**

**Name:**

**Representing:**

**Telephone:**

**Mailing Address:**

**Email Address:**

**1. Proposal:** *Include new or revised wording, or identification of wording to be deleted. Proposed text should be in legislative format. Use underscore to denote wording to be inserted (e.g. inserted wording) and strike-through to denote wording to be deleted (e.g. ~~deleted wording~~).*

**2. Statement of Problem & Substantiation for Proposal:** *Note: State the problem that will be resolved by your proposal and substantiation for your proposal.*

**3. Check one:**

This proposal is original material

This proposal is not original material

**(END OF PROPOSAL)**



## ● This Month's Question of the Month

Where operating at less than 50 volts, AC systems are required to be grounded where supplied by transformers if the transformer supply system is \_\_\_\_\_. **A)** bonded, **B)** grounded, **C)** ungrounded, **D)** isolated. *See the correct answer on page 2.*

## ● Note From The Chief

During the past year, Washington has continued to see a very sluggish construction economy. This summer, electrical work has picked up only slightly over last year. As with other parts of the construction industry, L&I's Electrical Program has seen a large downturn in inspection activity. As a result, we have been forced to reduce staffing by about 32% or 60 staff including 52 inspection or technical staff members. This has dramatically affected how we must now do business.

We are consolidating inspections to create more full inspection days for inspectors. This may cause some more remote inspections to be delayed longer than in the past. We are using computer systems more efficiently to gain more time for inspectors to be in the field. Many inspectors now begin their day without going to their office. This gains about 1 ½ hours each day for more inspection time, but reduces the time the inspector is available for code and other questions in the office. We have incorporated other small but significant changes into our way of doing business that will help the inspectors get to more jobs quicker than in the past.

It is critical that everyone in the electrical industry do their part in making the inspection process as efficient and effective as possible. Providing good addresses, directions, and access is critical to helping the inspector get to more jobs quicker. Taking responsibility for your work and reducing corrections is also very important. As noted in the May *Electrical Currents*, only 20% of all electrical contractors caused 74% of all reinspections.

The program's Correction Reduction Initiative will continue next year and in July, a new list of contractors will be developed for the coming twelve months. The group will include all contractors who have more corrections per inspection than the average electrical contractor. Because the need to reduce corrections is more important than ever, the program will be more proactive in helping all contractors reduce their corrections and the related reinspections. For instance, we will be more closely watching for contractors who routinely have the same type of corrections on their jobs. We will be contacting and working with those contractors to reduce their repeat violations. If repeat violations are not reduced, stronger action may be necessary. Use the initial contacts to improve the quality of your jobs, while saving you and the Electrical Program time and money.

## ● Is That Service Temporary or Permanent?

Some electrical contractors are installing an electrical service, for use during construction, very early in the construction process. A service will be considered temporary if the service is not complete and ready for permanent use. The temporary service must have a switched light for illumination, grounding and bonding appropriate for a temporary service, and an appropriate construction receptacle circuit(s) (i.e. GFCI, etc.). The temporary service requires a separate permit fee and will be inspected as a temporary service separate from the inspection of the permanent service.

When this type of temporary service is installed, the permanent service must be permitted under a separate permit fee – on the same or different electrical permit – and inspected for permanent service. The temporary and permanent service may utilize all or some of the same equipment. For a service to be considered permanent, the service must be complete and ready for permanent use when inspected. All temporary wiring and devices not intended for use in the permanent system must be removed. All grounding and bonding must be complete for all mechanical systems, building structural steel, and any grounding grids/electrodes that are a part of the final grounding/bonding system.

### Safety Tip of the Month!

Read the manufacturer's instructions on all products. They contain critical safety and use information that can prevent injury and death.

Then, follow those instructions!

### ● Retrofitting Signs With LEDs

Sign contractors are often replacing the illumination in channel-letter – pan-channel – signs with an LED illumination source while the sign remains installed on the jobsite. The sign contractor will have a contract with an electrical testing laboratory to list signs and is responsible to ensure that the sign meets all listing requirements. Retrofitting with LED illumination requires the sign contractor to remove the original neon, transformers, and associated high voltage wiring before replacing the neon system with a low voltage LED system listed for the purpose and installed in accordance with that listing. The retrofit eliminates the high voltage hazards associated with the neon lighting system and reduces the power consumption of the sign by about 90%.

NEC 600.3 requires listing and installation in compliance with the listing unless special permission is granted. The department will allow licensed electrical sign contractors to do the retrofit from neon to the LED illumination source at the jobsite, with the sign in place, so long as the sign contractor provides physical access to make a visual inspection of the LED components and provides, for use by the inspector during the inspection, the manufacturer's installation instructions and listing documentation for the LED system components. Owners or other types of contractors are not allowed to perform this type of retrofit.

### ● Fee Training Series – Mobile or Modular Homes and RV Parks or Sites

This is the third in a series of articles on selecting the appropriate permit fees for your work. WAC 296-46B-906(1), Residential, is separated into six sections. Paragraphs (e) and (f) are the primary sections to use when determining the permit fees for your mobile or modular home, mobile home park, or recreational vehicle park or site.

Paragraph (e) covers the service and feeder fees for individual mobile homes and modular homes that are not installed in a park. The title of (e) will be clarified in the upcoming change to the electrical WAC to remove the reference to mobile home parks and RV parks. The fee for a mobile/modular service is \$50.60 (see (e)(i)). The fee for a mobile/modular home feeder is also \$50.60 (see (e)(i)). If both are inspected together, a discounted rate of \$82.70 is available (see (e)(ii)).

Paragraph (f) covers the fees for services and feeders for mobile and RV parks. When there is no master service – one service supplying multiple mobile homes or RVs, the first individual site service or feeder fee is \$50.60 (see (f)(i)). For each additional site service or feeder, inspected at the same time as the first site service or feeder, the fee is \$32.00 (see (f)(ii)). For example, if you have two site services and they are inspected at the same time, the fee is \$82.60 (\$50.60 for the 1<sup>st</sup> site service, plus \$32.00 for the additional service). If the two site services are inspected separately, the fee is \$101.20 (\$50.60 for each site service). Another example – you have two site services with a feeder supplied by each service. All are inspected at the same time. The total fee is \$146.60 (\$50.60 for the 1<sup>st</sup> service, and \$96.00 for the remaining service and 2 feeders). If the 2 services and feeders are each inspected separately, the fee is \$202.40 (\$50.60 each).

When there is a master service supplying the sites in a park, the note in paragraph (f) says to use the fees in subsection (2) Commercial/Industrial. For example, if a new 800 ampere service is installed to supply power to a 400 ampere feeder, and to a 200 ampere feeder supplying power to a clubhouse. The 400 ampere feeder supplies two sites that are inspected at the same time. The total fee is \$515.80 (\$292.10 for the 800 ampere new service, \$76.70 for the 400 ampere feeder, \$64.40 for the 200 ampere feeder, \$50.60 for the 1st site, plus \$32.00 for the 2<sup>nd</sup> site - the two sites are inspected at the same time). If the two sites are not inspected at the same time, the total fee is \$534.40 (same as the previous example except the fees for the two sites is \$101.20).

If a 2<sup>nd</sup> 400 ampere feeder is installed at a later date to supply additional sites, the fee is \$193.80 (see (2)(a)). The fee is higher than for the original 400 ampere feeder because the 2<sup>nd</sup> feeder is being inspected separately from the original work.

For an existing park where the service/feeder is altered or repaired, use (2)(b)(i) to calculate the service/feeder fees. For example, if the park describe above is existing and the 400 ampere feeder is altered or repaired, the fee for the feeder is \$193.80. For an existing park where the meter or mast is repaired and there are no alterations to the service or feeder, the fee is \$70.30 regardless of the ampacity of the service or feeder (see (2)(b)(ii)).

### ● Answer to This Month's Question of the Month:

C) ungrounded (see NEC 250.020(A)). **Correction** to June's answer – The answer should have been **B) 20**.

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical> Page 2 of 2

## ● This Month's Question of the Month

An appeal of an electrical citation must be received by the department within \_\_\_\_ days, along with the appropriate appeal fee, after the notice of penalty has been sent. **A) 10, B) 20, C) 30, D) 45.**  
*See the correct answer on page 2.*

## ● Note From The Chief

We are regrouping after our recent layoffs and evaluating all aspects of the Electrical Program to achieve the highest level of efficiency and effectiveness with our limited resources. We are maximizing our inspection response by better grouping the inspectors' daily work. Some inspections may take longer if the job is remote and has no other inspections close by.

Even after the March 31<sup>st</sup> layoff, we made 93% of all inspections within 2 days after receiving the inspection request and 80% within 1 day after the inspection request was made. Inspectors work hard each day to keep up with the huge demands of their jobs. You can help them by getting your jobs done correctly – without corrections – and planning ahead to make sure we have access to inspect your job so that your request does not turn into an emergency.

We will continue to improve what is one of, if not the best, Electrical Program in the nation. The program's improvements, innovations, and hard work of recent years will continue to pay off with quality service for all our customers – electrical contractors and consumers – and make Washington an even safer place to live and work.

## ● DC Water Pumps and Controllers

Rural installations of small water pumping systems using direct-current pumps and controllers are being installed in Washington. Often, these pumps are powered by solar photovoltaic or wind turbine systems. This type of direct-current pump and controller does not have a U.L. standard and are not listed by any electrical testing laboratory. Because a standard is not available for the direct-current pump and controller listing or field evaluation is not possible, consequently the department will accept the pump and controller as supplied by the manufacturer.

The lack of standards for these direct current pumps/controllers presents an unavoidable Buyer Beware situation. All other components of the installation, charge controller, PV system, wind turbine, etc., must be appropriately listed, field evaluated, or if applicable, labeled by an approved engineer. The electrical inspector will inspect the entire installation as required in RCW 19.28.101.

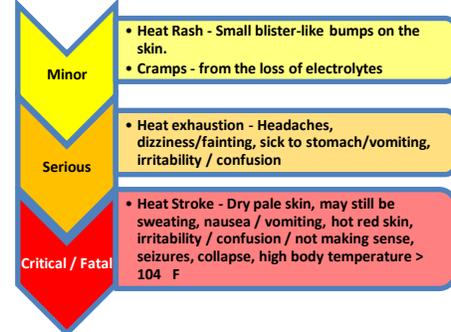
## ● Good Job Descriptions Equal Quicker And Better Inspections

The electrical inspectors continue to receive inspection requests with very poor descriptions of the work to be inspected and directions to the jobsite address. Help your inspector to quickly find your jobsite and the exact work to be inspected so that you will receive quicker and more accurate inspections. The following are actual job descriptions received on permits: "extend circuit," "structural," "run a circuit," "homeowner request," "circuit to heat pump," "add outlet in master bathroom," "wiring in new barn." Can you tell the difference? The first three are virtually useless to the inspector. The last three are clear and will enable the inspector to quickly find the work to be inspected.

Like the job description, it is equally important to provide good directions to your jobsite. Here are some examples of bad and good directions: "near Pinto Ridge Rd and Hwy 28," "Hwy 20," "on right, 1/2 mile south of Hwy 14 on Stonehenge Dr," "NW corner of Hoctor Rd. and W. Loop Dr." As with job descriptions, it is easy to tell the difference between good and bad instructions. Help yourself by helping the inspector.

### Safety Tip of the Month!

Summer is near; stay hydrated and avoid extreme heat conditions. Heat related illness ranges from mild to potentially fatal.



## ● Fee Training Series – Single/2-Family Residential Existing Structures And Systems And Multifamily Dwellings

This is the second in a series of articles on selecting the appropriate permit fees for your work. WAC 296-46B-906(1), Residential, is separated into six sections. Paragraphs (b), (c), (d) are the primary sections to use when determining the permit fees for changes to your existing single, 2-family, and new or existing multi-family residential electrical project.

Paragraph (b) covers multi-family residential and miscellaneous residential structures not included in paragraph (a). This includes: new apartment buildings and other residential structures that do not serve a direct accessory function to a single or 2-family residence like: shop, agricultural, hobby, personal aircraft hangers, separate apartments, etc. that do not serve a direct accessory function to the single or 2-family residence.

The fees in paragraph (b) are based upon the service/feeder size. For instance, in a multi-family building that has an 800 ampere service with two 400 ampere feeders supplying eight 100 ampere feeders would have a total permit fee of \$479.20 (i.e. the largest 800 ampere service/feeder (\$181.20) plus two additional 400 ampere feeders (2 X \$50.60 = \$101.20) plus eight additional 100 ampere feeders (8 X \$24.60 = \$196.80) equals a total fee of \$479.20). This fee includes all the building's branch circuits and is large enough to allow for no more than twelve ½ hour progress inspections.

For a new miscellaneous residential structure that does not serve a direct accessory function to a single or 2-family structure, you should use the same method to calculate your fees. For instance, for a new single family residence with a new horse barn being supplied by a 100 ampere feeder from the house, use paragraph (a) as described last month to calculate the fee for the house and use paragraph (b) to calculate the fee for the 100 ampere feeder to the barn. The barn feeder will cost \$82.70 in addition to the fee for the house.

Paragraph (c) should be used to calculate the fees for single, 2-family, or multi-family altered services or feeders. The fees in paragraph (c)(i) for altered services/feeders are similar to those in paragraph (b) for new installations. For instance, to replace a 200 ampere residential service, the fee is \$70.30. To replace an 800 ampere multi-family service with two 400 ampere feeders the fee is \$360.60 (i.e. 800 ampere service (\$155.00) plus two 400 ampere feeders (2 X \$102.80 = \$205.60) equals \$360.60). This fee includes all the branch circuits supplied directly by the service and the two feeders and is large enough to allow for no more than nine ½ hour progress inspections. The fee in paragraph (c)(ii) should be used when the only repair is to the meter and/or mast and there are no alterations necessary to the service or feeder supplied through that meter and/or mast. This is a flat rate fee of \$38.10 regardless of the amperage.

Paragraph (d) should be used for circuit additions in areas where the building and other circuits already exist. The most common usage is when adding outlets to existing circuits or when adding circuits in an existing area or where the circuit already exists (e.g. bonus room with existing circuit available to supply the room). For instance, when adding outlets onto four different circuits supplied from a single panelboard, the fee is \$50.60. If the outlets are being added onto five different circuits supplied from a single panelboard, the fee is \$56.10 (i.e. first four circuits (\$50.60) plus fifth circuit (\$5.50) equals \$56.10). When adding outlets to onto four different circuits supplied from two panelboards, the fee is \$50.60 per panelboard for a total fee of \$101.20. When more than four circuits to a panelboard are altered, add \$5.50 per circuit as described in the previous example.

If the paragraph (d) fee equals or exceeds the fee for the panelboard containing the altered circuits, you should use the fee in paragraph (c) instead of (d) for those circuits. For instance, you are adding outlets to 20 circuits in a 200 ampere panelboard. Using paragraph (d), the fee would be \$138.60 (i.e. 1<sup>st</sup> four circuits (\$50.60) plus 16 circuits (\$5.50 X 16 = \$88.00) equals \$138.60). Using paragraph (c) for a 200 ampere panelboard, including all circuits, the fee is \$70.30. Since the fee calculated in (d) - \$138.60 - is greater than that calculated in (c) - \$70.30 - your final fee should be the lower fee calculated in paragraph (c) of \$70.30. Paragraph (d) should not be used when the area being wired is new square footage (e.g. additions, bump outs, attic remodels, bonus room without available circuit, etc.) or there is not existing circuit available for supplying the area. The fees, for additions that add square footage to the original house, should be calculated using the square footage in paragraph (1)(a).

## ● Answer to This Month's Question of the Month:

D) 20 (see RCW 19.28.131)

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical>

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## ● This Month's Question of the Month

In a dwelling with a 120/240-volt, 200 ampere service there are three separately controlled heating units at 1,000 watts each. The calculated heating load using the NEC optional method is \_\_\_\_\_. **A)** 6,000 volt-amperes, **B)** 4,000 volt-amperes, **C)** 2,400 volt-amperes, **D)** 1,950 volt-amperes. See the correct answer on page 2.

## ● Note From The Chief

L&I has been receiving complaints from contractors and inspectors about having to be the primary quality control for contractors and their assigned administrators/master electricians that do not verify the electrical work done by their electricians is up to code and safe before calling for inspection.

RCW 19.28.361 makes the installer – contractor and electrician – personally responsible and liable for any injury or damage to a person or property for any defect in the electrical installation. The RCW goes on to say that the inspector is not responsible for the safety of the installation.

Inspectors do not inspect each termination, piece of wire, wire connector, or other device or equipment. The inspector is not on the job to create a “punch list” of items that need repairing or witness testing required by the NEC or other codes (e.g. fire alarm testing, ground fault testing, etc.). However, the inspector may test the final installation of devices like receptacle polarity, ground fault circuit interrupters, and arc-fault protection devices.

The inspector's job is to quickly do a quick visual inspection to assure that the contractor and assigned administrator/master electrician has done the quality control work for their installations. The inspector is not expected to and will not be able to find every correction in an electrical installation. To find every possible problem in an electrical installation would essentially require the inspector to personally perform the complete installation.

Inspectors and your customers expect to be able to inspect each installation without encountering significant safety problems – no corrections. Of the 117,560 inspections made this year, only 21,173 – 18% – had corrections written. Remarkably, only 20% of all electrical contractors caused 74% of all reinspections. Because the contractor failed to be responsible for the quality of their electricians' work, and corrections were issued which resulted in the need for a reinspection. All contractors, administrators, and electricians should do their part in reducing the number of corrections the inspector encounters. Your reduction of corrections will save everyone time and money.

## ● Outdoor Generator Disconnecting Means

There is some confusion as to the intent of WAC 296-46B-225(2) regarding the requirements for a feeder disconnecting means when an outdoor generator is used to supply a building. The Washington Administrative Code 296-46A was changed in 2001, to clarify that a feeder disconnecting means installed within 15' of a building was to be considered “in/on the building” and not subject to the requirements of NEC 225 for outside feeders. This change moved the feeder disconnection requirement to NEC 215, essentially eliminating the requirements of NEC 225 for outdoor feeders.

2008 NEC 700.12(B)(6), 701.11(B)(5), and 702.11 were changed to require the disconnecting means for an outdoor generator installed within sight of a building that is used as the building disconnecting means to meet the requirements of NEC 225.36 – service rated. Because of the original intent of the WAC rule, a service rating will not be required for these disconnecting means.

The Electrical Program will propose a rule change to again clarify the intent of the WAC – that a feeder disconnecting means, located within 15' of the building, is considered to be on/in the building and subject to the

### Safety Tip of the Month!

GFCI receptacles have been shown to reduce the danger of electrocution, especially in locations where contact with water is likely.

They must be tested to ensure they still work. With a device plugged into the receptacle, press the TEST button. The device should not work. Press the RESET to restore power to the outlet.

requirements of NEC 215 – in the next technical WAC change process. At this time, a feeder disconnecting means installed in a readily accessible location on an outdoor generator located within 15' of the building does not have to be service rated. The WAC will be open for proposals in the fall of 2010.

### ● Fee Training Series – Single/2-Family Residential New Construction

This is the first in a series of articles on selecting the appropriate permit fees for your work. Many permit purchasers use incorrect fee lines for determining the cost of their electrical permit. This series of articles will break down permit purchasing into some of the more common types of permit purchases.

WAC 296-46B-906(1), Residential, is separated into six sections – (a) single/2-family new construction, (b) multi-family new construction, (c) single/multi-family altered services/feeders, (d) single/multi-family circuits only, (e) mobile/modular homes and parks, and (f) mobile home park sites. WAC 296-46B-906(1)(a) is the primary section to use when determining the permit fees for your new residential electrical project.

Single and 2-family new construction fees are primarily based upon the square footage of the unit(s) plus the square footage for an attached garage. You should use the dwelling square footage listed on the building plans approved by the building official for your basic calculation plus the exterior wall square footage for the attached garage. For example, if your house has a total of 1,305 square feet, the fee is \$101.30 (\$76.70 for the 1<sup>st</sup> 1,300 square feet plus \$24.60 for the additional 5 square feet). An additional \$24.60 is required for each 500 square feet or portion of that is over the initial 1,300 square feet.

Section (1)(a) also includes additional fees for outbuildings, swimming pools/spas, and septic systems. These fees are separated into two categories – those inspected “*at the same time*” and those “*inspected separately*.” “*At the same time*” means all wiring is to be ready for inspection during the initial – *first* – inspection. “*Inspected separately*” means the wiring is not ready for inspection during the initial inspection. For example, if the house described above had a septic system inspected after the initial inspection, an additional septic fee of \$50.60 would be required, bringing the total fee to \$151.90.

Outbuildings are structures that serve a “*direct accessory*” function required to support the residence, such as a pump house or storage building. Outbuilding does not include buildings used for commercial or other purposes (e.g. hobby buildings, workshops, etc.). Using the outbuilding fees in (1)(a) for these structures is incorrect. Fees for buildings and other wiring not serving a direct accessory function to the dwelling or when the dwelling is not built will be covered in later articles.

If a dwelling building permit has not been issued by the building official, Section (1)(a) fees cannot be used for outbuildings, pools/spas, or septic systems. The fees in Section (1)(b) should be used for outbuildings, pools/spas, or septic systems when the dwelling is not on the property. If a dwelling building permit and an electrical permit for the dwelling has been issued, but the dwelling is not ready for inspection, the fees in Section (1)(a) for “*inspected separately*” should be used for outbuildings, pools/spas, or septic systems.

Additional progress inspection, generator, emergency inspections, thermostat and other miscellaneous fees may also apply and would need to be added to the permit. These are found in section (5) Miscellaneous. For example, the described house would have an additional fee of \$70.30 (WAC 296-46B-906(5)(g) & 906(1)(c)(i) if a permanent generator 200 amperes or smaller is also installed.

The total fee must not be less than the number of progress inspection units (1/2 hour interval of inspection time or any part of) times the progress inspection fee rate from section (8) - \$38.20. For instance, the house described above with the generator may have up to 5 progress inspections without additional progress fees being required - \$222.20 / \$38.20 = 5.8 progress inspection units. This fee does not support a 6<sup>th</sup> trip. If a 6<sup>th</sup> inspection unit is needed, an additional progress inspection unit fee of \$38.20 will be required before the inspection is made.

If “*trip*” fees are assessed per WAC 296-46B-906(7), they do not count as a permit fee covering progress inspections. Trip fees are penalty fees that are separate from the regular permit for any type of installation.

### ● Answer to This Month’s Question of the Month:

D) 1,950 volt-amperes (see NEC 220.82)



## ● This Month's Question of the Month

The maximum voltage that is allowed in a dwelling unit is **A)** 120 volts between conductors **B)** 250 volts nominal **C)** 277 volts to ground **D)** 600 system volts. *See the correct answer on page 2.*

## ● Electrical Board Recruitment – General Public Seat

There will be a vacancy on the Electrical Board in July. Dave Jacobson has served in the General Public Seat on the board for ten years. He has been appointed to the Chairmanship of the Pierce County Citizen's Advisory Board and elected as a Pierce County Parks and Recreation Commissioner. Dave's new duties preclude him from reapplying for the Electrical Board at the end of his term. Thanks Dave for all your hard work and dedication to the electrical and telecommunications industry.

Anyone interested in applying for the General Public Seat can get an application form on the Governor's website at: <http://www.governor.wa.gov/boards/application/default.asp>. Application must be made using the Governor's form. Send your resume and any additional information you would like considered in a separate e-mail to the Boards and Commissions mailbox at [GovernorGregoireBoardsandCommissions@gov.wa.gov](mailto:GovernorGregoireBoardsandCommissions@gov.wa.gov). Recommendation letters should be sent to the Governor's office. If you have questions about the position or the Electrical Board, contact: Crystal Forsberg at (360) 902-5249.

## ● Continuing Education Instructors Do Not Represent L&I Or Any Other AHJ

The Electrical Program approves hundreds of electrical education courses and instructors each year; however, they do not represent L&I, the Electrical Program, or any Authority Having Jurisdiction (AHJ). The program reviews each course's basic curriculum and process and the minimum credentials for instructors.

Instructors, even those who may be or have been inspectors, only represent the training class sponsor. They do not represent L&I or any other AHJ. As with any class or book, attendees must be aware that for an official interpretation of any code, rule, or policy, they must ask the AHJ directly. Interpretations by class instructors or authors may or may not be correct. If you make an improper installation or violate a permitting, licensing, or certification law, you will be accountable, even if you believe your instructor provided you with a correct interpretation.

Many instructors have a disclaimer in their presentation – that they do not represent any AHJ. However, some do not clearly say that they only represent themselves and the course provider. If you have any doubt about what the official interpretation will be, ask questions of the AHJ.

## ● Equipment Approval Options For Industrial Equipment

Electrical contractors are still confused regarding the allowed types of approval for equipment. There are two basic categories of equipment:

- Industrial control panels and industrial utilization equipment as defined in WAC 296-46B-903(5) – This equipment may be listed or field evaluated by an approved electrical testing laboratory or reviewed/approved by an approved electrical engineer.
- All other equipment – This equipment may be listed or field evaluated by an approved electrical testing laboratory
- Normal L&I inspection – If the electrical system of the equipment is comprised of listed components installed in conformance with the NEC and WAC. Additional fees may be required for inspection time.

If a field evaluation or engineer review is used to gain equipment acceptance, the laboratory or engineer must request approval from L&I's Chief Electrical Inspector before the review is begun. Equipment not accepted by the Authority Having Jurisdiction (AHJ) should not be operated without AHJ approval.

### Safety Tip of the Month!

Avoid head on motor vehicle collisions by keeping your wheels straight when waiting to make a left turn.

If your wheels are turned left and your vehicle is struck from behind by another vehicle, you may be pushed into oncoming traffic.

## ● Generator Fees

L&I has found contractors and owners attempting to use the incorrect fee schedules when buying permits. The fee schedule for generators is found in WAC 296-46B-906(5)(g). Remember that, for electrical permit fees, wind turbine, photovoltaic systems, and fuel cell systems are also considered to be generators. Remember that the initial permit fee must cover all trips. A trip is equal to one inspection or 30 minutes of inspection time per inspection, whichever is less. The permit fee must be at least \$76.40 to qualify for two trips.

The fee for a portable generator is currently \$70.30. For permanently installed generators you must use the appropriate residential or commercial new/altered service or feeder section, not the section for new residential construction.

Do not assume that the fee for a generator is included in the square foot permit cost for a new residence. Generators are a separate fee line item. For residential generators, use WAC 296-46B-906(1)(b) for new generators or 906(1)(c) for altered generator feeders.

- For a new generator, 200 amperes or less, with no other work, the fee is currently \$82.70. If another feeder or service is involved, the initial fee is \$24.60 (WAC 296-46B-906(1)(b)).
- For an existing generator system work (e.g. replacement of generator, transfer switch, generator system wiring, etc.), 200 amperes or less, the initial fee is currently \$70.30 (WAC 296-46B-906(1)(c)).

For commercial generators, use WAC 296-46B-906(2)(a) for new generators or 906(2)(b) for altered generator feeders.

## ● Passive Testing Is OK Without A Contractor's License

Passive testing of electrical systems does not require electrical contractor licensing, electrician certification, or permitting and inspection. Passive, means that the tester does not interfere, in any way, with the electrical system (e.g. does not: un-terminate/terminate any wiring, device, or other equipment). The tester may use electrical instruments to perform tests of the electrical system or change adjustable setting of timers, relays, or other adjustments that can be made without un-terminating/terminating. An example of passive testing is when a fire alarm system is given an operational test by an owner, owner's representative, or fire official.

## ● Note From The Chief

As you know, the Electrical Program experienced a second round of layoffs March 31<sup>st</sup>. Because of the continuing sluggish construction economy, we were forced to lose thirteen valuable members of our inspection staff. Permit revenue has fallen by 24% since 2007. Since last year, we have had to lay off 59 inspectors and support staff – about one-third of our total workforce. Because of the most recent layoff, contractors may need to build in longer inspection wait times into their construction schedules.

Because of the layoffs, the number of inspections each inspector must complete has risen. There will be times when the inspector will be able to complete the inspection in the 24-hour timeframe, such as when a site is geographically close to another needing an inspection, or in emergency situations; but our goal is centered on a 48-hour inspection response. We know how time-sensitive building schedules are, so we are hoping builders will plan for longer wait times.

Yet, through this transition, much will remain unchanged – we must stay relentlessly focused on delivering excellent electrical inspections and upon having a strong compliance presence. We will continue to maintain rapid responses to inspection requests and vigilance with the underground economy and contractors who attempt to operate with inappropriate competitive advantages (not buying permits, working unsupervised trainees, etc.). While we focus on our mission, we will also be looking for innovative ways to be even more efficient and effective than we have been in the past. This will not be easy; but, I am confident that we can find great opportunity for the Electrical Program in the challenges ahead. I hope all of you are as well. Our mission has been "We Keep Washington Safe." That will not change.

## ● Answer to This Month's Question of the Month:

D) 600 system volts (see NEC 690.7(C))



## ● This Month's Question of the Month

A panelboard containing the interconnected electric power production source (IEEPS) interconnection point has a 60 ampere main breaker. A 60 ampere IEPPS source breaker is located next to the main breaker. The minimum rating of the panelboard is **A) 60 amperes B) 70 amperes C) 100 amperes D) 120 amperes**. See the correct answer on page 2.

## ● 2010 Legislative Activity

Two bills were proposed this legislative session that directly impact the Electrical Program.

HB 2555 passed both the House and Senate and allows the Electrical Program to issue subpoenas when requested information is not provided. HB 2555 will provide another tool to help us combat the underground economy and level the competitive playing field for legitimate electrical contractors.

HB 2546 passed both the House and Senate and raises the requirements for trainees' classroom training to 48 hour per renewal period. This requirement is to be phased in. To renew on or after July 1, 2011, trainees must have 32 hours of classroom training. To renew on or after July 1, 2013, they must have 48 hours. This bill will improve the trainees' educational process and knowledge – they will be better electricians.

## ● Time Sensitive and Critical Inspections

In some situations, the timing of the electrical inspection is critical to the customer's needs. Because of our limited inspection staff, we need your help in coordinating the inspection timelines. Let the inspector or supervisor know in advance when you have a critical need. As with your project, we must plan ahead. Do not commit to your customer that the inspector will arrive at a specific time without first coordinating with the inspector or the inspector's supervisor. Without prior coordination, we may have a prior commitment that will make us unavailable to do your inspection when you need it done.

We are committed to working with you to make the inspection process as timely as possible. It is to everyone's advantage to communicate needs and availability. You, your customers, and the inspectors want the inspection process to go as smoothly as possible. We will do our best to be available for your critical inspection needs.

## ● HVAC Marking Requirements

We continue to have to write many corrections because the HVAC installing electrician fails to do the field marking required on furnaces with electric strip heating modules.

NEC 424.28(A) says, "**Marking Required.** Each unit of fixed electric space-heating equipment shall be provided with a nameplate giving the identifying name and the normal rating in volts and watts or in volts and amperes" and "Electric space-heating equipment intended for use on alternating current only or direct current only shall be marked to so indicate. The marking of equipment consisting of motors over 1/8 hp and other loads shall specify the rating of the motor in volts, amperes, and frequency, and the heating load in volts and watts or in volts and amperes." Part (B) of the article requires the label to be located so it is visible or easily accessible after the installation is complete.

You can avoid the expense and time required for reinspections by identifying the heating modules installed on the label provided by the furnace manufacturer. This marking is the responsibility of the HVAC installing electrician. It is critical for both the electrician providing the circuit wiring and overcurrent protection and the inspector making the inspection to have this information before they can begin their work.

### Safety Tip of the Month!

Protect you, your family, and your investment – Make certain you hire a legitimate electrical contractor who:

- Uses certified electricians; and
- Gets the work inspected.

Check your contractor's and electrician's status at:

<https://fortress.wa.gov/lni/bbip/Search.aspx>

## ● Fighting the Underground Economy

Operating outside the requirements for licensing, certification, and permitting is very tempting to some individuals and contractors working in today's economy. The underground economy and companies attempting to operate with an unfair competitive advantage take work away from legitimate contractors and individual electricians who take pride in their work and the electrical industry.

L&I is actively doing everything possible to reduce these impacts. As a result our electrical inspectors' efforts, assisted by the E-CORE team, we have had another successful year working proactively with the industry and combating companies and individuals not playing by the rules. For the 2009, calendar year the electrical program issued 9,114 electrical violations. 70% or about 6,400 were issued for unlicensed contracting, uncertified electricians, doing work with no permit, or a related issue. All these violations are considered to be a part of the underground economy.

No matter what you do, inspector, contractor, electrician, regulator, or citizen, we encourage you to do your part in reducing the negative effects of the people who choose to violate the electrical laws and compete unfairly and in many cases unsafely with the legitimate electrical industry. We welcome your referrals about this type of unfair and illegal activity. If you know or suspect this type of violation, we encourage you to notify your local L&I electrical inspection office or a member of our compliance investigative team. Contact numbers for our offices can be found at <http://www.lni.wa.gov/Main/ContactInfo/OfficeLocations/default.asp> or you can call the investigative team at (360) 902-5249.

Please do your part by helping provide a level competitive environment for legitimate contractors so they can provide safe electrical installations for their customers.

## ● Testing Laboratories and Engineer Evaluators

We have recently approved a new testing laboratory, Communication Certification Laboratory (CCL), and engineer evaluator, Picatti Brothers, Inc. Their contact information along with the other approved laboratories and engineers can be found at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/Install/default.asp>

Plan ahead and if you have equipment that is not properly labeled, make contact with one of our approved laboratories or engineers to get the correct evaluation and approval before requesting an inspection, resulting in an electrical correction. Don't hold up your job's progress.

## ● Inspector Safety

The permit holder must make the electrical inspector aware of any potential physical or health hazards prior to the inspection being performed. Inspectors are faced with many potential hazards (e.g. loose dogs, hazardous chemicals, structural damage, open floor holes, etc.) when making inspections.

The permit holder must have all hazard(s) clearly marked or make the inspector or supervisor aware of the hazard. It is your responsibility to make the inspector aware of all potential hazards prior to the inspection. Mark the outside of the jobsite, make a comment about the hazard on the on-line inspection request form, or otherwise directly notify the inspector of the hazard.

● **Last Month's Question of the Month:** How much money can you save by renewing your journeyman or specialty electrician certificate using the online web process? \$6.80

## ● Answer to This Month's Question of the Month:

D) 120 amperes, see NEC 705.12(D)(7).



## ● New Electrical Examination Information

Beginning on March 1, 2010:

- All electrical examinations will be based on the 2008 National Electrical Code, WAC 296-46B, and 19.28 RCW. This applies for all examination candidates even if they started the examination process before March 1, 2010.
- The examination will be offered at the following Washington PSI testing sites: Spokane, Pasco, Yakima, East Wenatchee, Burlington, Everett, Seattle, Tacoma, Olympia and Vancouver. The examination is also available nationwide at over 200 PSI testing sites.

### Safety Tip of the Month!

Tough economic times are pressuring everyone to do more with less

Everyone deserves to have their loved ones home safely at the end of the day.

Never compromise safety for any reason.

Make safety your priority!

Electrical examinations occurring before March 1, 2010, must be scheduled by contacting PSI at: 1-800-211-2754.

If you are planning on taking an electrical examination on or after March 1, 2010, you may schedule for an examination with PSI using one of the following methods:

- Via the Internet 24 hours a day at [www.psiexams.com](http://www.psiexams.com)
- Using a touch-tone phone, call PSI 24 hours a day at (800) 733-9267
- With a PSI registrar at (800) 733-9267, available Monday through Friday, between 4:30 am and 5:00 pm and Saturday, between 8:00 am and 2:00 pm, Pacific Time.

In order to ensure that the appropriate person is taking the examination, each time you take an electrical exam from L&I's examination contractor, PSI, you will need to **provide two forms of identification** before being allowed to test.

One must be a VALID form of government issued identification (e.g. driver's license, state ID, passport, etc.). The second must have your signature and preprinted legal name (e.g. employee ID, credit/debit card, etc.). Identification must match the name on the registration form.

Do not schedule for an examination unless you have the required identification or have made special arrangements three weeks prior to your exam date with PSI.

## ● Electrical Program Staff Reductions

The nationwide downturn in construction continues to adversely affect the electrical industry in Washington State. Electrical permit sales remain sluggish. As a result, reductions in staffing are again necessary to assure that the electrical program expenditures do not deplete the dedicated electrical fund. Just like our stake holders, the electrical program has to live within their means.

- Staff reductions amounting to 35 electrical inspectors and 5 regional customer service specialists occurred at this time last year.
- This year's reductions include 1 field supervisor, 6 lead inspectors, 6 inspectors and 6 licensing and technical staff – 19 additional positions. The staff cuts will be effective March 31, 2010.

The electrical program continues to seek out and implement every process improvement possible to help us continue to provide high quality service. Just like our stakeholders, our remaining inspectors will have more area to cover after March 31<sup>st</sup>. You will likely see some changes in our inspection practices and in some instances our ability to quickly respond to inspection requests.

Please help us to serve you better by making certain you have:

- Entered the correct address and posted it plainly at the jobsite.
- Entered complete directions on the permit application so we can easily find the jobsite.
- Provided a detailed description of the work that was done
- Given us any information we might need to gain access on every trip to do your inspection.
- Talked directly with your inspector in advance of needing an urgent or scheduled inspection.
- Committed to inspection timelines with your customer that we are aware of and able to meet.

**● Where Are Tamper Resistant Outlets Required In Dwelling Units?**

NEC 406.11 requires that all required dwelling unit receptacle outlets required by NEC 210.52 must be tamper resistant. However, there are exceptions – Receptacle outlets that are part of a luminaire or appliance, or controlled by a wall switch in accordance with 210.70(A)(1), Exception No. 1, or located within cabinets or cupboards, or located more than 1.7m (5 1/2 ft) above the floor installed in addition to those required by NEC 210.52 are not required to be tamper resistant.

**● Permitted Uses Expanded For Multiconductor Type TC Cable**

The permitted uses for tray cable are found in NEC 336.10. In addition to those permitted uses, Type TC multiconductor cable will be permitted to be used in all building classifications where Type NM cable is allowed by WAC 296-46B-334. Type TC cable is arguably more durable than Type NMB. The jacket on a NM cable usually is 20 mils thick with a 10 mil paper covering under it. The protective jacket of Type TC cable must be at least 45 mils thick.

When Type TC cable is used in NEC 334 applications, it must be installed in strict conformance with Part II of NEC Article 334 and the bending radius requirements of NEC 336.26 or adhere strictly to the requirements of NEC Article 336.

**● Concrete Encased Electrodes - Materials, Installation And Inspection**

Concrete encased electrodes are defined in NEC 250.52(A)(3) as an acceptable electrode permitted for grounding. The electrode must be encased by at least 2 inches of concrete, located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth. In addition the electrode must be made of at least 20 feet of one or more bare or zinc galvanized or other electrically conductive steel reinforcing bars or rods of not less than ½ inch in diameter or consisting of at least 20 feet of bare copper conductor not smaller than 4 AWG. Numerous studies have shown that a properly installed concrete encased electrode system will maintain a resistance of four ohms or less to ground for the life of the foundation.

In order to ensure that the concrete encased electrode functions properly, reinforcing bars or rods encapsulated with non-conductive coating such as epoxy cannot be used. The required 20 feet of reinforcing bar or rod may be made of multiple pieces joined together by tie wire to satisfy the length requirement. The concrete encased electrode is not required to be connected to the rest of the rebar in the footings and walls; but that connection is recommended so that the electrode is as large as possible. In addition, vapor barriers or insulating material are not allowed between the concrete footing/foundation and the earth.

Three inspection possibilities for concrete encased electrodes exist in [WAC 296-46B-250\(2\)](#):

- 1) At the time of inspection of other work on the project, providing the concrete-encased electrode is accessible for visual inspection.
- 2) At the time of the service inspection providing the installer has provided a method so the inspector can verify the continuity of the electrode conductor along its entire length. This can be accomplished by attaching a length of copper wire to one end of the electrode that reaches the location of the grounding electrode conductor that will enable the inspector to measure the resistance of the required 20 feet of rebar with a standard resistance tester.
- 3) Other methods when prior approval, on a jobsite basis, is given by the inspector.

**● Electrical Question of the Month**

**This Month's Question:** How much money can you save by renewing your journeyman or specialty electrician certificate using the online web process? **A)** \$2.57, **B)** \$4.26, **C)** \$6.80, **D)** \$5.00.

Hint: [WAC 296-46B-909](#)

Save money by renewing online at: <http://lni.wa.gov/TradesLicensing/LicensingReq/Legal.asp>

**Last Month's Question:** The output of a utility interactive inverter in an interconnected electric power production system may be connected to \_\_\_\_\_ of the service disconnecting means. **A)** the line side, **B)** the load side, **C)** only the load side, **D)** the line or load side The answer is: **D)** See NEC 705.12.



## ● Legislative Proposals for the 2010 Legislative Session

The legislature began hearing legislative proposals January 11<sup>th</sup>. There are several bills being considered that might affect the Electrical Program. If you are interested in these or other proposed legislation, you can find bill information at the legislative website: <http://apps.leg.wa.gov/billinfo/>

- HB 1008      Wind turbine requirements
- HB 2546      Increasing requirement for trainee education
- HB 2555      Granting Electrical Program subpoena power
- SB 5021      Exempt renewable power sources from chapter RCW 19.28 (Electrical oversight)

This legislation is not sponsored or promoted by L&I. It has been submitted for consideration by individuals and associations interested in changing the law to promote their causes.

## ● Identification Requirements for Electrical Examination Candidates

In order to ensure that the appropriate person is taking the examination, all candidates taking an electrician or administrator exam from L&I's examination contractor, PSI, will need to provide two forms of identification before being allowed to test.

This applies each time you test. One must be a VALID form of government issued identification (e.g. driver's license, state ID, passport, etc.). The second must have your signature and preprinted legal name (e.g. employee ID, credit/debit card, etc.). Identification must match the name on the registration form.

If you are unable to provide this identification, you must contact PSI at least three weeks prior to attempting your examination in order to make special arrangements.

Do not schedule for an examination unless you have the required identification or have made special arrangements with PSI.

## ● Maintaining Fire Alarm Systems Requires Appropriate Electrical Licensing and Certification

WAC 212-12-035(2) in the Fire Marshall's rules requires that, *"In all Group E-3, I, LC Occupancies, annual certification of fire alarm systems shall be performed by the holder of a current low-voltage electrical contractors specialty license issued by the Department of Labor and Industries."*

Labor and Industries regulates the licensing of electrical contractors and the certification of workers who perform electrical work. Fire alarm testing or maintenance work that involves disconnecting and reconnecting electrical connections or replacing components must be performed by a properly licensed electrical contractor employing properly certified electricians or properly supervised trainees in strict conformance with all requirements of chapter 19.28 RCW and chapter 296-46B WAC.

## ● Continuing Education and Trainee Classes are not Completed Until the Roster is Submitted

When taking an electrical training class, you should make certain that the class provider promptly submits the roster for your class. The provider has seven calendar days in which to submit the electronic roster to L&I. You have not completed the class until the roster is submitted to L&I. You can verify that your course provider has properly applied your course credit by reviewing your education information at:

<https://fortress.wa.gov/lni/bbip/Search.aspx>

### Safety Tip of the Month!

Practice safe work methods. Never assume a circuit is off. Always turn the circuit off and verify that it is not energized before working on or inspecting an electrical system.

De-energized circuits never shock or kill!

Completed courses are no longer displayed on our external website if they have been applied to satisfy previous renewal requirements. Contact the course provider if you are missing credit for a completed course. Completion certificates will not be accepted as evidence that your education requirements have been fulfilled.

If you do not complete the class or the roster is not submitted in a timely manner, you may be late in completing your education requirements.

Do not wait until the last minute to take your class.

### ● **Licensing and Certification Requirements for Mixed Occupancy Buildings of Three Floors or Less**

It is becoming more common for owners and builders to construct buildings with mixed use occupancies.

For example, you may see a three story building with the street level as retail commercial and the top two floors being residential occupancy. In this example, an (02) Residential specialty can work in the residential occupancy area because the building is no higher than 3 stories above grade. For practical purposes, the commercial or residential floors could be at any of the three levels.

The residential specialty is restricted to working only inside the residential occupancy area(s) of the building. Occupancy areas are set by the building official. To confirm the occupancy rating, you must look at the approved building plans or contact the building official.

As an installer or inspector, you must remain aware that the residential specialty is limited to very specific wiring methods. Review WAC 296-46B-920(2)(a) for specific restrictions.

Any part of the residential occupancy's electrical system located outside the residential occupancy area(s) (i.e. in the commercial occupancy area, etc.) must be installed by a (01) general or appropriate specialty contractor/electrician. Any part of the commercial occupancy's electrical system located within the residential occupancy must be installed by a (01) general or appropriate specialty contractor/electrician.

This restriction may require the (01) contractor/electrician to install feeders and/or branch circuits from/through the commercial occupancy area to the residential areas.

In the example to the right, the (01) must install the feeders from the building service in the retail space to the two residential sub-panels. The (02) may install the residential sub-panels and the wiring from them so long as it remains inside the residential areas. If residential wiring passes through the retail space, the wiring must be installed by the (01). All



### ● **Sizing and Disconnect Requirements for NEC 702 Optional Standby Systems**

Installers should be aware that NEC 702.5(B) requires that the load connected to a supply source be calculated in accordance with NEC 220. Optional sources of power connected through an automatic transfer switch must be sized to supply the full calculated load. For instance, if the calculation showed a load of 2.5 kw, the optional source of power (e.g. generator, etc.) must be sized at least 2.5 kw.

Another installation problem routinely encountered by inspectors is the failure of the installer to use a properly rated disconnecting means for outdoor generator sets. NEC 702.11 requires that the disconnecting means must meet the requirements of NEC 225.36. NEC 225.36 requires that the disconnecting means be suitable for use as service equipment, except that in garages and outbuildings on residential property, a snap switch or a set of 3-way or 4-way snap switches are permitted as the disconnecting means.

### ● **Electrical Question of the Month**

**This Month's Question:** The output of a utility interactive inverter in an interconnected electric power production system may be connected to \_\_\_\_\_ of the service disconnecting means. **A)** the line side, **B)** the load side, **C)** only the load side, **D)** the line or load side

**Last Month's Question:** What is the ampacity of a #2 AWG aluminum Type SE cable used as an apartment unit main feeder installed indoors in an 80 °F environment? **A)** 75 amps, **B)** 95 amps, **C)** 100 amps, **D)** 90 amps. The answer is: **C)** 100 amps as allowed by NEC 310.15(B)(6)



## ● Implementation Date And Locations For New Electrical Examinations

Beginning on March 1, 2010:

- All electrical examinations will be based on the 2008 National Electrical Code, WAC 296-46B, and 19.28 RCW. This applies for all examination candidates even if they started the examination process before March 1, 2010.
- The examination will be offered at the following Washington PSI testing sites: Spokane, Pasco, Yakima, East Wenatchee, Burlington, Everett, Seattle, Tacoma, Olympia and Vancouver. The examination is also available nationwide at over 200 PSI testing sites.

### Safety Tip of the Month!

Daylight is very limited this time of the year. Always wear your reflective clothing so that others can see you. Wearing reflective clothing everyday reduces the possibility of injury from a motor vehicle or other mobile equipment.

Electrical examinations occurring before March 1, 2010, must be scheduled by contacting PSI at: 1-800-211-2754.

If you are planning on taking an electrical examination on or after March 1, 2010, you may schedule for an examination with PSI after mid February, using one of the following methods:

- Via the Internet 24 hours a day at [www.psiexams.com](http://www.psiexams.com)
- Using a touch-tone phone, call PSI 24 hours a day at (800) 733-9267
- With a PSI registrar at (800) 733-9267, available Monday through Friday, between 4:30 am and 5:00 pm and Saturday, between 8:00 am and 2:00 pm, Pacific Time.

The next edition of the Electrical Currents will contain more information on the examination process.

## ● Circuit Extensions Connected By Extension Cords Are Not Allowed

A variety of products are now on the market in response to the demand for providing concealed power to wall mounted flat screen televisions and similar devices. Most of these products consist of a kit that contains a cut-in outlet box for behind the television, a cut-in outlet box for below the television, a length of Type NM used to connect the two boxes and a standard duplex receptacle for behind the TV. Also included in the kit is a male receptacle for the lower cut in box and an extension cord used to connect the male receptacle to a nearby existing outlet. This picture is an example of one manufacturer's system.



NEC 408.4 (1) says that flexible cords and cables must not be used as a substitute for the fixed wiring of a structure. The requirements of the National Electrical Code take precedence over any overall product listing information provided with this type of circuit extension kit.

## ● Access to Wiring Box Behind Surface Mounted Luminaires

Generally, a surface mounted luminaire, such as a fluorescent strip, must have a hole providing access to the wiring in the luminaire's outlet box. The only exception is when the luminaire is designed to be solely supported by the box. The National Electrical Code is very clear about this requirement.

NEC 410.24(B) states, "Electric-discharge luminaires surface mounted over concealed outlet, pull, or junction boxes and designed not to be supported solely by the outlet box shall be provided with suitable openings in the back of the luminaire to provide access to the wiring in the box."

### ● Scope-Of-Work Crossover, Proper Supervision And Reporting Training Hours Legally

**A specialty electrical contractor's scope of work determines the type of specialty electrician they can employ and dispatch without supervision.** If a specialty electrician's certification type is not the same as the contractor's license type, then the individual must have a training certificate and be working under proper supervision. There are three exceptions: **a)** a journeyman (01) electrician can work (as a specialty electrician) for any type of specialty contractor or, **b)** a residential (02) specialty electrician can work for a (07B) residential maintenance contractor and do work within the contractor's scope without supervision or, **c)** an electrician in a specialty that has a "sub-specialty" detailed in WAC 269-46B, Table 920-1 may work for a sub-specialty contractor within the scope of the more limited sub-specialty.

The following is an updated guide, originally printed in the January 2002 and May 2004 editions of this newsletter, to help contractors, electricians, and trainees provide proper personnel and supervision on their jobsites, report training hours in the appropriate categories, and avoid citations for working illegally.

| TYPE OF WORK PERFORMED<br>(see scopes in WAC 296-46B-920)                                  | Contractor<br>must be: | Category of Hours Reported   | Trainee must<br>be supervised<br>by:    |
|--|------------------------|--|---|
| <b>(01) General Electrical:<br/>(Including All Types Of<br/>Specialty Electrical Work)</b> | 01                     | New Commercial/Industrial (01)<br>Report hours in the specific specialty<br>type(s) of work performed. | 01<br>01 or<br>Appropriate<br>Specialty |
| <b>(02) Residential Construction</b>   | 02                     | Residential (02)   | 01, 02                                  |
| <b>(03) Pump and Irrigation</b>  | 03                     | Pump and Irrigation (03)   | 01, 03                                  |
| <b>(03A) Domestic Well</b>   | 03 or 03A              | Domestic Well (03A)  | 01, 03, 03A                             |
| <b>(04) Sign and Outline Lighting</b>  | 04                     | Sign (04)  | 01, 04                                  |
| <b>(06) Limited Energy Systems</b>   | 06                     | Limited Energy Systems (06)  | 01, 06                                  |
| <b>(06A) HVAC/R</b>  | 06A                    | HVAC/R (06A)   | 01, 06A                                 |
| <b>(06B) HVAC/R-restricted</b>   | 06A or 06B             | HVAC/R-restricted (06B)  | 01, 06A, 06B                            |
| <b>(07) Non-Residential<br/>Maintenance</b>  | 07                     | Non-Residential Maintenance (07)   | 01, 07                                  |
| <b>(07C) Restricted Non-Resid.<br/>Maint.</b>  | 07 or 07C              | Restricted Non-Resid. Maintenance<br>(07C)   | 01, 07, 07C                             |
| <b>(07B) Residential Maintenance</b>   | 02, 07, 07C,<br>or 07B | Residential Maintenance (07B)  | 01, 02, 07, 07C,<br>07B                 |
| <b>(07A) Non-Resid. Lighting Maint.</b>  | 07, 07C, or<br>07A     | Non-Resid. Lighting Maintenance<br>(07A)   | 01, 07, 07C,<br>07A                     |
| <b>(07D) Appliance Repair</b>  | 07, 07E, or<br>07D     | Appliance Repair (07D)   | 01, 07, 07E,<br>07D                     |
| <b>(07E) Equipment Repair</b>  | 07 or 07E              | Equipment Repair (07E)   | 01, 07, 07E                             |
| <b>(09) Telecommunications</b>   | 09                     | None—WAC 296-46B-945(13)(c)  | N/A                                     |
| <b>(10) Door, Gate, and Similar<br/>Systems</b>  | 10                     | Door, Gate, and Similar Systems (10)   | 01, 10                                  |

### ● Electrical Question of the Month

**This Month's Question:** What is the ampacity of a #2 AWG aluminum Type SE cable used as an apartment unit main feeder installed indoors in an 80 °F environment? **A)** 75 amps, **B)** 95 amps, **C)** 100 amps, **D)** 90 amps.

**Last Month's Question:** What is the ampacity of a #6 AWG Copper Type SE cable installed indoors in an 86 °F environment? **A)** 40 amps, **B)** 50 amps, **C)** 65 amps, **D)** 55 amps.

The answer is: **D)** 55 Amps. NEC 338.10(B)(4)(a) refers to the requirements of Article 334, Part II (including the temperature limitations in NEC 334.80). Table 310.16 was used to determine conductor ampacity and correction factors.



## ● New Law Requires Electricians And Trainees To Carry Photo Identification

Governor Gregoire signed [SHB 1055](#) into law in April, 2009. This new law became effective July 26<sup>th</sup> and amends the identification requirements for electricians and trainees in chapter 19.28 RCW. After July 26, 2009, all electricians and electrical trainees must be in possession of their electrical certificate and a government-issued photo identification at all times when working as an electrician or trainee.

You must present your electrician or training certification and other means of identification when asked by an L&I or city/county inspector or the owner or owner's representative of the electrical system where the work is being performed. All inspectors and electrical system owners are authorized to request identification of anyone doing electrical work. If you do not comply with the request for identification you are subject to civil penalties.

Printed copies of the current version of [Chapter 19.28 RCW](#) effective July 26, 2009 will soon be available from your local L&I service location.

## ● New Exams For Electricians And Administrators Are Coming Soon

Early in 2010, electrical examinations will be based upon the 2008 National Electrical Code, WAC 296-46B, and 19.28 RCW. After the implementation date, all applicants will take the updated examinations. This applies for all candidates, even if they started the examination process before the implementation date.

Questions on the updated examinations are based on the fundamentals of the National Electric Code and the electrical laws and rules of Washington. All of the questions reflect current code terminology and definitions. The examination content is unchanged. You can find the examination content at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/ExamInfo/default.asp>

The PSI exam delivery platform now has enhanced security features that will help insure the integrity of the examination process. Duplication of exams will be eliminated by randomly generating the questions for each exam. A photographic record of each exam candidate will be maintained in the PSI database for future identity verification.

The effective date for the new electrical examinations and locations of the PSI testing facilities will be announced in the next edition of the *Electrical Currents*.

Be the first to know of actions and opportunities relevant to the electrical trade:.

Join the LNI-Electrical electronic mailing list at: <http://lni.wa.gov/Main/Listservs/Electrical.asp>.

## ● Bedroom Circuits In Dwellings Require Arc-Fault Circuit Protection

Everyone should be familiar with the NEC requirement for all 120 volt, 15 and 20 amp outlets in a dwelling to be protected with arc-fault circuit interrupters (AFCI). WAC 296-46B-210(4) amends the broader AFCI requirements of the 2008 NEC by only requiring AFCI protection for outlets in dwelling unit bedroom spaces.

Do not confuse an outlet with a receptacle. While a receptacle is an outlet, an outlet isn't necessarily a receptacle. The NEC defines an outlet as "a point on the electrical circuit at which current is taken to supply utilization equipment." Examples of bedroom outlets could include 120 volt, 15 and 20 amp receptacles, light fixtures, fans, motorized blinds, exhaust fans, heating and cooling equipment, etc.

AFCI protection is not required for smoke or fire alarm outlets. AFCI protection is also not required for replacement outlets or for existing extended circuits if the original circuit was installed before December 1, 2005.

### Safety Tip of the Month!

Standing water, ice or snow may conceal hidden hazards.

Help avoid slips, trips and falls by wearing proper footwear and proceeding with caution at all times. Trust your instincts and training, if it is unsafe, find a safe route to get there or don't go!

**● Look Up A Contractor, Electrician, Plumber or Elevator Professionals**

[Look Up a Contractor, Electrician, Plumber Or Elevator Professional](#) offers new a feature. A “hover over” function has been added to provide a more complete description of the status shown. Here is the list of the status descriptions that will appear when you hover over the “status”:

**Active** –Meets current requirements.

**Expired** – Licensee has failed to renew.

**Suspended** – Business or person that has been suspended by the department due to not meeting current licensing requirements.

**Inactive for Lack of CEU's** – Individual has paid renewal fee but has not met continuing education requirements to satisfy renewal.

**Relicensed** –Contractor has relicensed under another name, structure, or specialty.

**Out of Business** – Company that has changed status of license to Out of Business. (This status may also be used for businesses or people who have other active licenses in place of this record).

**Superseded** – Individual license has been replaced with a new higher level license.

**Temporary** – Individual has been granted an active license on a temporary basis.

**Retest** –Person who is currently expired, and is in process of retesting to re-establish certification.

**Inactive** – Indicates name change of an individual or business

**● 2008 NEC Change Affects The Use Of Service Entrance Cable Type SE And USE In Interior Installations**

The 2007 Committee Report on Proposals shows that Code Making Panel 7 intended to limit the final ampacity of types SE and USE cables, for most interior installations, to that of 60 °C rated conductors.

As a result, the words “*excluding 334.80*” were removed from the text of Article 338.10(B)(4)(a) in the 2008 NEC. This made all the requirements in Article 334, Part II (including the temperature limitations in NEC 334.80) apply to type SE and USE cables installed inside a building.

However, when these cables are used as the main power feeder to a dwelling unit NEC 310.15(B)(6) applies. For a main power feeder, you should use the ampacity allowed in Table 310.15(B)(6). The main power feeder is defined as service-entrance, service-lateral, or feeder conductors serving as the main power feeder to each dwelling unit when those conductors are installed in a raceway or cable. These cables will carry the full load of the dwelling unit. When used as a main power feeder, the NEC allows cables to be used at a higher ampacity because of the diversity normally found in dwelling units.

Table 310.15(B)(6) cannot be used for ampacity ratings for other feeders or branch circuits. When the table ratings of 310.15(B)(6) are used, you should not impose the temperature limitations of 334.80 on type SE or USE cables that carry the full load of a dwelling unit.

**● Minimum Circuit Ampacity**

Minimum circuit ampacity is the ampacity of a conductor after all correction factors have been applied. The NEC typically allows the use of the next highest rated overcurrent device if the ampacity of the conductor falls between standard ratings. The rating of circuit's overcurrent device does not determine the minimum ampacity of a circuit unless it is less than the ampacity of the conductor.

Always ensure that the ampacity of the equipment supply conductors are equal to or higher than the minimum circuit ampacity shown on the equipment nameplate.

**● Electrical Question of the Month**

**What is the ampacity of a #6 AWG Copper Type SE cable installed indoors in an 86 °F environment? A) 40 amps, B) 50 amps, C) 65 amps, D) 55 amps.**

**October's Question:** In a dwelling unit, what combination of dedicated circuits would be allowed to supply receptacles that supply three 120 volt ½ horsepower garage door openers? **A) One 15 amp and one 20 amp circuit, B) Three 15 amp circuits, C) One 20 amp circuit, D) Just add them the same circuit as the other garage outlets.**

The correct answer is: **B) Three 15 amp circuits**



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 10

October 2009

## ● Revised WAC-296-46B Effective October 31, 2009

Public hearings on the WAC proposals were held in Tumwater during the last week of August. The majority of the comments were supportive in nature. Important changes include:

- Permit and licensing fees increase 5.20%
- Reciprocal and temporary electrician language has been removed
- Amends continuing education requirements

### Safety Tip of the Month!

**Focus your mind on driving when behind the wheel.** There is nothing more important!

Remember to increase your following distance in poor weather. This simple adjustment helps you maneuver and stop safely when you need to.

Printed copies of the revised WAC rules are at the printer will be available for purchase shortly at a service location near you. The final revised rules are also available electronically at:

<http://lni.wa.gov/TradesLicensing/Electrical/LawRulePol/LawsRules/default.asp>

## ● First Aid Classes Reduced To Four Hours of CEU Credit

The Washington State Electrical Board recently recommended that continuing education credit for first aid courses be limited to a maximum of four hours.

Providers of first aid continuing education courses for Washington electricians and administrators will be required to submit their courses to the department for approval. First aid training materials must be part of the curriculum of a nationally recognized first aid training organization. First aid course instructors are not required to be approved by the department.

Course completion certificates or first aid cards will not be accepted for proof of course completion for those completed after October 30<sup>th</sup>. Any course taken after October 30<sup>th</sup> must be pre-approved in order for you to receive credit. Course providers will be required to use the electronic Trades Education Roster Recording System (TERRS) to enter continuing education credit for their students.

A list of approved continuing education courses and the forms for submitting a course are found at:

<http://lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/Education/ContinueEd/default.asp>

## ● Continuing Education Reciprocal Agreements End November 30, 2009

At their April 30<sup>th</sup> meeting, the Electrical Board weighed the pros and cons of continuing education reciprocity and made a unanimous decision to abolish continuing education reciprocity with all states. Credit will be given for all eligible reciprocal continuing education classes completed prior to November 30, 2009. After this date, credit will only be allowed for Washington approved courses. Some of the reasons the board felt this decision is now appropriate include:

- Over the past fifteen years, electrician continuing education delivery and content has changed dramatically. The advent of correspondence and internet delivered continuing education classes has reduced the need for reciprocity and required that specific review criteria be set in place for these types of classes. Several states, including Washington, have already placed specific individual and specific limitations on the delivery of these types of classes.
- Because of severe budget reductions and staff layoffs, Washington is implementing every process improvement possible to save staffing time and resources. Washington continuing education providers have been required, for several years, to electronically enter class rosters directly into Washington's electrician certification database. This process completely automates our certification renewal process for electricians.

The Board will allow classes (and instructors) to be held in other states to submit an application for approval as a Washington course. You can find a complete list of currently approved courses and forms for submitting new course applications and instructor candidates at:

<http://lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/Education/ContinueEd/default.asp>

### ● Permit Fees For Completing Projects Started By Others.

The economic downturn has caused many projects to halt construction prior to the final inspection. In many instances the property has changed hands and new electrical contractor is hired to finish the job. The new contractor must obtain a new electrical work permit to finish the electrical installation.

If service and cover inspection have been completed under a previous permit, the installation will be allowed to be permitted as "Other Inspections." The permit fee and description can be found in WAC 296-46B-906(11). The minimum portal to portal fee will cover one hour of time to finalize the inspection process. Permit applications for "Other Inspections" must have an accurate description of work.

Fees for additional time may be added to the permit if necessary. Any work not included on the original contractor's work must be described and permitted at the normal fees (e.g. new septic, feeder, or other item not on the original permit).

### ● HVAC Equipment Nameplates

**HVAC installers and contractors please take notice.** We want you to have the opportunity to avoid the expense of return trips to make corrections by being aware of the marking requirements that apply to HVAC equipment. Failure to complete the equipment nameplate information (i.e. heat strip and other marking) will result in electrical corrections to the electrical contractor for not meeting the marking requirements, NEC 424.28 and for not following the equipment manufacturer's instructions, NEC 110.3(B). Other corrections may be issued if the wiring to the equipment is not appropriately sized and protected.

The person installing the furnace equipment is initially responsible for marking the label accurately. However, the electrician connecting power to the furnace has the responsibility to not connect wiring to the equipment if the label is not properly marked.

Avoid delaying your jobs by fully and accurately completing the required information on the nameplate. Only connect the equipment if the equipment nameplate is completely filled out and accurate.

### ● "Normal" Electrical Inspection Of Equipment And Machinery

Successful "normal electrical inspection" of the electrical system of unlisted equipment or machinery requires all the equipment's electrical system components and materials to be listed and labeled and installed in conformance with the NEC. Complex installations may require drawings of the system and additional fees to cover inspection time.

The electrical system of unlisted equipment not constructed to the NEC must be proven to meet an appropriate electrical safety standard by having the equipment field evaluated by an approved testing laboratory or by engineering review (for industrial utilization equipment only).

More information can be found in related article published in the November 2007 *Electrical Currents*:

<http://lni.wa.gov/TradesLicensing/Electrical/files/currents/elc0711.pdf>

### ● Labor & Industries Longview Office Has Moved To Kelso

The Longview office of the Department of Labor & Industries (L&I) has relocated to 711 Vine St. in Kelso. Office hours and telephone numbers will remain the same.

L&I is moving because of a state goal to use space in state-owned buildings wherever possible. With the expiration of the Longview office lease, L&I was able to move to a space in Kelso previously occupied by another state agency.

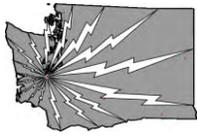
### ● Electrical Question of the Month

**This Month's Question:** In a dwelling unit, what combination of dedicated circuits would be allowed to supply receptacles that supply three 120 volt ½ horsepower garage door openers? **A)** One 15 amp and one 20 amp circuit, **B)** Three 15 amp circuits, **C)** One 20 amp circuit, **D)** Just add them the same circuit as the other garage outlets.

**September's Question:** Are main breakers still required for temporary power service panels?

**A)** Always, **B)** Never, **C)** Only if there are more than six service disconnects

The answer is: **C)** Only if there are more than six service disconnects. [NEC 408.36, Exception #1]



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 9

September 2009

## ● Electrical Inspector Don Holland Passes Away

Donald Holland passed away at the age of 56 years old on August 17, 2009 in Everett, WA. Don was born April 7, 1953, in Yakima to Joe and Tressie Holland. After High School, Don served in the U.S. Marine Corp, completed Perry Technical Institute, and became an electrician. Don worked as an electrician for 20 years in the Yakima Valley. In 1999, he moved to Arlington, Washington where he was employed as an L&I Electrical Inspector in the Everett area. It was there that he found many new friends and shared laughs with his co-workers. Don will be deeply missed.

## ● New Publications for Homeowners

Homeowners may be unaware of requirements that help ensure safe electrical installations are made on their property. New publications are available to assist homeowners in making informed decisions. The best way to ensure the work done on your property is safe is to make certain that it is permitted and inspected. There is very little electrical work that is exempt from permitting and inspection. The new publications are available at:

<http://www.lni.wa.gov/IPUB/500-078-000.pdf> and <http://www.lni.wa.gov/IPUB/500-115-000.pdf>

## ● Electrical Permit Fees

The fees listed in WAC 296-46B-906 must always support the number of progress inspection trips requested by the permit holder and the amount of time necessary to perform the inspection. All inspections are based upon ½ hour of inspection time. Each progress trip or ½ hour, whichever is more, is charged at \$36.40. Any fee less than \$72.80 must have no more than ½ hour of inspection time.

If a permit purchaser buys a permit for less than \$72.80 and schedules the work so two separate progress inspections are needed, the initial fee does not support the cost of the inspections. An additional trip fee (\$36.40) will be added to the original fee to support the second inspection request.

Electrical permit fees must cover the time and number of trips required for all progress inspections (e.g. ditch cover, concrete encased electrodes, slab, cover, service, etc.). Requests for multiple progress inspections may result in the assessment of additional trip fees.

If corrections have been issued during a progress inspection, the department does not charge for the first return trip to verify the safety corrections have been made. If the corrections are not made or were made in a way that is not code compliant, the next return trip will be assessed a \$36.40 trip fee because the work is not ready for inspection.

When a final inspection is called, all work should be complete and code compliant. The cost of the initial final inspection is included in the initial base fee. The department does not charge for the initial final inspection. If deficiencies are noted during the final inspection, additional fees will be assessed because the work is not ready for inspection.

## ● Unlisted Low Voltage Devices And Equipment Must Be Fed From A Listed Class 2 Transformer

For some types of low voltage systems (30 volts or less) it can be difficult or impossible to find listed low voltage devices and equipment. Field evaluation is always an option for unlisted equipment, but in many cases the cost of the evaluation far exceeds the cost of the equipment. For some low voltage equipment there is an alternative.

### Safety Tip of the Month!

Avoid backing accidents by parking your vehicle so that backing is not required when you leave.

Positioning your vehicle while hazards and obstacles are in view will reduce the chances of an accident when you leave.

Unlisted low voltage utilization equipment or devices will be approved if they receive their power from a listed Class 2 transformer or power supply and comply with all of the following.

- The Class 2 transformer is listed and used in accordance with the manufacturer instructions.
- The wiring method used complies with NEC 725.
- The secondary voltage of the Class 2 transformer/power supply does not exceed 30 volts.
- The secondary side of the Class 2 transformer/power supply is protected by a 5-ampere maximum fuse, or a fuse derived by dividing 100 VA by the secondary voltage whichever is less.
- A permanent marking is affixed as near as practicable to the transformer/power supply and must indicate the size and type of replacement fuse, or the fuse must be integrated into the transformer/power supply assembly requiring replacement of the unit.
- The Class 2 circuit does not supply life safety equipment or emergency egress, such as: fire alarm, rescue systems, and classified (hazardous) locations.
- The equipment and devices must be located exclusively within the Class 2 circuit (i.e. isolated from all other electrical circuits).

### ● Wiring Methods for Luminaires In Patient Care Areas

The health care facility administrator, with oversight from the Department of Health, is responsible for determining which areas of a medical facility are patient care areas. Corridors, storage rooms, lounges, dining rooms, or similar areas are not usually classified as patient care areas.

In patient care areas, NEC 517.13(A) requires that all branch circuits are provided with an effective ground-fault current path by installation in a metal raceway system or in a cable with a metallic armor or sheath that is listed for grounding. A separate equipment grounding conductor, installed in a non-metallic raceway or in a cable, that lacks a metallic armor or sheath listed for grounding is not a substitute for this requirement.

An additional insulated equipment grounding conductor described in NEC 517.13(B) is required only if the luminaires are lower than 7½ feet above the floor or have switches located in the patient care vicinity

The patient care vicinity is generally defined as anywhere within 6 feet of a patient's bed up to a height of 7½ feet above the floor.

### ● Are You Celebrating A Birthday This Fall? Save Money and Renew Online!

Renewing your license or certificate online is quick and easy. You will receive it much faster and save money at the same time. You can renew as early as 90 days before your expiration date at:

<http://lni.wa.gov/TradesLicensing/LicensingReq/Legal.asp>

You are only permitted to renew if all of your continuing education requirements are met. Your licensing information including your continuing education credits can be viewed at at:

<https://fortress.wa.gov/lni/bbip/Search.aspx> .

A Washington approved continuing education provider is responsible for posting your course credits to the system within seven days of course completion. If you have attended a Washington approved course and have not been properly credited, please contact the course provider to resolve the matter.

If you are looking for a continuing education class or basic classroom education course to fulfill your education requirements, here is the link to the list of Washington approved courses:

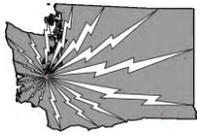
<http://lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/Education/default.asp>

### ● Electrical Question of the Month

**This Month's Question:** Are main breakers still required for temporary power service panels?

**A) Always, B) Never, C) Only when there are more than six service disconnects**

**August's Question:** How many voting members comprise the Washington State Electrical Board?? **A) 13, B) 14, C) 15, D) 16.** The answer is: **B) 14** voting members (RCW 19.28.311).



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 8

August 2009

## ● Class B Labels --- Easy To Use --- Saves Time And Money

About 3,000 Class B permits are used by contractors each month. Using Class B basic electrical work permits reduces costs, time and money, to the contractor, customer, and the electrical program while maintaining an acceptable level of inspection oversight. Class B labels are used for specific *“Electrical work that requires minimal electrical circuit modifications and has limited exposure hazards.”* The specific rules for using Class B labels are found in [WAC 296-46B-908](#). A single Class B label may be used for different types of Class B work (e.g. extended circuit, motor replacement, etc.) when all the work is done at the same time.

The labels are packaged in books of 20 and can be purchased or ordered, using your contractor deposit account for mail shipment, from any of our service locations for only \$200! If you purchase 100 thermostat permits a year, you save \$2,640 by using Class B permits instead of a normal permit.

Each label has two parts. Each must be filled out before work is begun. You can fill the labels out at the office or jobsite, whatever works best for you! Just remember to completely fill out both parts of the label with accurate legible information. The jobsite portion of the label must be affixed to the electrical panel, control panel, or equipment before starting the installation. The contractor portion of the label must be sent to the address printed on the bottom of the label within 15 working days from the date on the label. The date must be the date the label is affixed.

A Class B label becomes an active permit when it is posted and may be inspected on a random basis. You do not request an inspection for a Class B. L&I will make the arrangements for access for the inspection. If access cannot be arranged with your customer, you will need to assist in getting access.

Class B permits have been a very popular subject in the Electrical Currents Newsletter. Here is the link to a fully searchable compilation that contains every edition of the Electrical Currents ever published: <http://lni.wa.gov/TradesLicensing/Electrical/files/currents/ALLCurrents.pdf>. Just type in the words *Class B* in the find or search box and you will have over 150 hits. There have been some changes over time, so always remember that the most current information always takes precedence.

For more information, send your questions to [electricalprogram@lni.wa.gov](mailto:electricalprogram@lni.wa.gov) and one of our program specialists will assist you.

## ● Portable And Vehicle Mounted Generators: Grounding Electrode Exemptions

Requirements for the use of portable and vehicle mounted generators are often misunderstood. The frame of a portable or vehicle mounted generator is not required to be connected to a grounding electrode for a system supplied by the generator if the conditions of NEC 250.34 are met. Most equipment manufacturer's instructions refer you to the NEC for grounding requirements and provide specific grounding connection instructions if the NEC requires connection to a grounding electrode.

A connection to a grounding electrode is not required when a portable or vehicle mounted generator only supplies equipment mounted on the generator and/or cord and plug connected loads supplied through the grounded receptacles on the generator. Equipment grounding is accomplished through the frame of the generator. For a vehicle mounted generator, the vehicle frame must be bonded to the generator frame. If the generator manufacturer's instructions specifically require connection to a grounding electrode, NEC 250.34(A) does not apply and a grounding electrode system must be installed.

Occupational Safety & Health Administration (OSHA) has a publication addressing the generator grounding electrode exemption and potential hazards when generators are connected to a grounding electrode. Parts I and III of their publication provide excellent insight into this topic. This publication can be viewed at:

<http://oshaprofessor.com/Portable%20Generators%20and%20OSHA%20Construction%20Standards%203-05.pdf>

### Safety Tip of the Month!

It's that time of the year again when we all have to be extra vigilant in ensuring we stay hydrated.

When working in the hot sun or in enclosed spaces that are subject to extreme heat make sure you drink plenty of water

When in doubt

Have A Drink!

## ● Can Specialty Contractors Bid Electrical Jobs That Have Work Out Of Their Allowed Scope Of Work?

Specialty electrical or telecommunication contractors cannot normally bid electrical work outside the scope of work allowed for their electrical contractor license. In very limited situations a specialty electrical or telecommunications contractor may bid on and subcontract an electrical project that contains electrical work outside the scope of work allowed for their specialty electrical license. The electrical project's work that is outside their allowed scope of work must be an insignificant portion of the total project and be directly associated with the portion of work that is within the specialty contractor's allowed scope of work. Consider the following scenario.

A building owner solicits bids for a large project to install a low voltage energy management system in a commercial office building. The bid's proposed installation includes a 120 volt branch circuit that is necessary to power the energy management system's electrical controller. In this example, 98% of the project is within the EC06 limited energy specialty contractor's allowed scope of work.

The 120 volt branch circuit is not in the EC06 contractor's allowed scope of work. However, the EC06 specialty contractor is allowed to bid and subcontract this project because the branch circuit is an insignificant portion of the overall project and is directly associated the electrical work that is with the EC06 contractor's allowed scope of work (i.e. powering the low voltage energy management system). In this example, the EC06 contractor may subcontract the work that is outside the scope of their 06 license (i.e. the branch circuit) to an EC01 general electrical contractor.

If any portion of this electrical project had been not directly associated with the low voltage portion of the work, or if a significant portion of the work had been outside of the scope of work allowed for the specialty contractor, then the EC06 limited energy specialty electrical contractor would not be allowed to bid or subcontract the project.

It is also important to remember that if there are multiple licensed electrical contractors working on the same project, each contractor will have its own permit and electrical crew separate from the other contractor(s).

## ● HVAC Ductless Split-systems Are Not Appliances

Because of their versatility, efficiency, and energy rebate incentives ductless split systems are becoming more popular in commercial and residential jobs. Equipment manufacturers and NEC 440 also sometimes refers to HVAC equipment as an appliance. However, the WAC 296-46B-100(7) and (33) definitions for an appliance are very limited. Under the WAC definitions, fixed air-conditioning/heat pump equipment is never an appliance. In addition, equipment that either supplies or receives power to/from another piece of equipment is never an appliance. Do not make the mistake of applying the rules of NEC 422 Appliances when installing this equipment.

Because these listed assemblies include a hermetic compressor this equipment falls under the installation rules of NEC 440 Air Conditioning and Refrigeration Equipment.

These systems can be very simple (e.g. one outdoor and one indoor unit), or very sophisticated (e.g. multiple indoor units located in different rooms (zones)). The outdoor and indoor unit may be supplied from separate branch circuits or the indoor unit may be supplied directly from the outdoor unit. A 06A specialty electrical contractor can install the units and all low voltage conductors. A 01 contractor or 02 contractor, for residential, must install all line voltage conductors and equipment including any disconnecting means that is not installed in the equipment by the manufacturer.

### Electrical Question of the Month

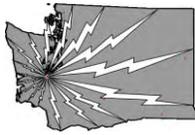
**This Month's Question:** How many voting members comprise the Washington State Electrical Board?  
A) 13, B) 14, C) 15, D) 16.

**Last Month's Question:** The conductor intended to be used as the grounded conductor in a flexible cord must have a continuous marker that distinguishes it from other conductors. Which of the following methods is not an approved distinguisher? A) white or gray colored insulation, B) number or letter, C) tinned conductor, D) white or gray colored braid. The answer is: B) [NEC 400.22].

**Previous Month's Question:** It was pointed out by several of our observant stakeholders that there actually was no correct answer to choose from for the "Question of the Month" in the month of June. The closest answer was B) 8,800, but the actual answer should have been 8,500. **Good catch!**

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical> Page 2 of 2

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## ● Really... Is There Anything This Electrical Inspector Can't Do?

Al Reed-Costa is one of those rare individuals who seem to succeed at everything he puts his mind to. Whether graduating from the apprenticeship and becoming a journeyman electrician, operating an electrical contracting business, or working as a L&I plans examiner and assisting with ECORE compliance, Al not only succeeds, but excels.

So what does someone like Al do in his spare time – **How about world class weightlifting!**



Some of Al's most notable achievements so far include:

- Won back-to-back National Collegiate titles and set new national records with 330 (snatch) and 369 (clean & jerk) lbs. while simultaneously working as an electrical apprentice.
- Took 5<sup>th</sup> Place in the 2000, World Collegiate Championship.
- Won back-to-back Masters National titles for 35-39 year olds, setting new national records with 340 (snatch) & 419 (clean & jerk) lbs.
- Went to the 2008, Olympics in Beijing, China as an assistant coach for Melanie Roach.
- Holds the state record for the Snatch with 155 kg (341 lbs.) and Clean and Jerk with 190 kg. (418 lbs.).
- Reunited with his high school sweetheart and is planning to get married in 2010.

Al began lifting in junior high at the age of 14 as a way to build strength for wrestling. He knew right away he had found something he really enjoyed. In 1991, he moved from his home in New Jersey to Washington to train with his USA national coach, John Thrush of Sumner, WA. In 1996, he began his apprenticeship with the South Western Washington JATC. In 2006, he started a small electrical

contracting business and operated it until joining our team, in 2008, as a plans examiner.

Al continues to lift competitively, is training for the 2012 Olympics team, and enjoys coaching young athletes. Al's all time heaviest lift was a back squat training lift of 347 kg. That's 765 pounds!

When asked, "What is the key to your success?" Al replied, "I try to focus on what is at hand without losing sight of my ultimate goal. It's all about the process rather than the destination. This is especially true when working with young people. I tell them life is a marathon, not a sprint. Things will happen and it'll get you down if you let it. Keep in mind you can only control yourself, and do your best to keep moving forward. You have to believe in yourself, and those around you."

## ● Electrical Board – Electrical Contractor Position Vacancy

There is currently an electrical contractor position vacancy on the Electrical Board. The application form is available on the Governor's website at:

<http://www.governor.wa.gov/boards/application/default.asp>

Application must be made using the Governor's form. Applicants must also send a resume to the email address listed on the Governor's website. Recommendation letters should also be sent to the Governor's office. If you have

### Safety Tip of the Month!

Approximately 100,000 annual vehicle crashes are attributed to drowsy drivers. When driving your vehicle for long periods watch for the signs:

- Excessive yawning
- Nodding
- Disjointed thoughts
- Lane drifting
- Vision blurring or lack of focus
- Forgetting the last few miles

**Don't become a statistic!**

questions about the position or the Electrical Board, contact: Crystal Forsberg at (360) 902-5249.

### ● Contractors Without Electrical Administrators Must Reassign Within 90 Days

If an assigned administrator/master electrician chooses to separate from an electrical contractor they must submit a "Change Assignment of Administrator/Master Certificate" with the required fee within 10 days of separating.

The department will automatically un-assign the administrator/master electrician if the administrator/master certificate expires, is suspended, or revoked.

In either case, the contractor will receive a letter from the department stating that the assigned administrator/master electrician has been separated from the company and the contractor has 90 days from the date of separation to assign a new administrator/master electrician. If a new assignment is not made, the electrical contractor's license will be suspended. Once suspended, the contractor will need to pay a reinstatement fee of \$47.30 to be reactivated and have an assigned administrator/master.

Whether assigning or un-assigning, use form F503-009-000. The fee for this is \$35 fee. The form can be found on our website at: <http://www.lni.wa.gov/FormPub/Detail.asp?DocID=1813>

### ● Correction Reduction Initiative New Contractor Group For Fiscal Year 2010

The Correction Reduction Initiative for Fiscal Year 2009 ended June 30<sup>th</sup> and has once again been very successful in appreciably lowering the number of corrections written to contractors in the initiative.

A new group has been identified for Fiscal Year 2010 (July 1, 2008 through June 30, 2009). The initiative this year will focus on all electrical contractors who receive more corrections per inspection than the average electrical contractor. The Electrical Program will work with these contractors to help them improve - saving them the time and money necessary to revisit jobsites to make corrections.

### ● Driving Directions Are Required For Electrical Work Permit Inspections

You must provide the electrical inspector with adequate driving directions to your jobsite. If you fail to provide clear driving directions on your electrical permit, the inspector may not be able to find your jobsite. This will result a delay of your inspection, multiple trips for the inspector, additional fees for you, and possible civil penalties.

You must provide turn by turn directions from the nearest main crossroad to the permit jobsite. Detailed directions enable electrical inspectors to locate your jobsite quickly saving everyone time and money.

Never assume that the inspector is familiar with your local area. Inspectors routinely inspect areas that are not familiar to them. Some addresses are very simple to find. Others are not so easy – particularly those in rural or farming areas. Be as detailed as possible and use landmarks that can be easily seen from the road. Never reference web site hyperlinks such as Map Quest or Google Map or make reference such as "see Thomas Guide page 44".

Give the same directions you would give to a policeman, firefighter, or emergency medical technician if you needed them there right away.

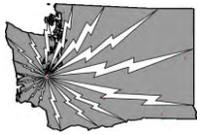
### ● The WAC Revision Process Continues

As mentioned in previous Electrical Currents (see May), Washington Administrative Code WAC 296-46B is being revised. Stakeholders may comment on proposed changes during the public comment period or at the public hearing that is tentatively scheduled to be held at the L&I Building, Room S117, 7273 Linderson Way SW, Tumwater, WA, 98501 on August 26th. The tentative effective date is October 31st.

### ● Electrical Question of the Month

**This Month's Question:** The conductor intended to be used as the grounded conductor in a flexible cord must have a continuous marker that distinguishes it from other conductors. Which of the following methods is not an approved distinguisher? **A)** white or gray colored insulation, **B)** number or letter, **C)** tinned conductor, **D)** white or gray colored braid.

**Last Month's Question:** For a 240V, 3-wire circuit, what is the minimum branch-circuit load allowed for a 13.25 KW household electric range installed in a dwelling unit?? **A)** 9275 watts, **B)** 8800 watts, **C)** 8000 watts, **D)** 6160 Watts The answer is: **B)** 8,800 [NEC Table 220.55 see note 1.].



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 6

June 2009

## ● New Law Requires Electricians And Trainees To Carry Photo Identification

Governor Gregoire signed HB 1055 into law in April, 2009. This new law will be effective July 26<sup>th</sup> and amends the existing language in RCW 19.28.271. After July 26<sup>th</sup>, all electricians and trainees must be in possession of their electrical certificate and government-issued photo identification at all times when working as an electrician or trainee. Anyone found to be in violation of this law is subject to civil penalties.

## ● Only An Apprenticeship Training Director Can Submit Electrical Apprentice Hours

In the past, electrical contractors who are employers of apprentices registered in an apprenticeship program (training agents) were allowed to report electrical training hours for an apprentice directly to the department using an Affidavit of Experience signed by the contractor. This practice is in conflict with WAC 296-46B-965(11)(c). The only way a contractor can submit an affidavit of experience for a trainee is if that trainee is not enrolled in an electrical apprenticeship.

The path to exam eligibility for registered apprentices is through the completion and graduation from an approved apprenticeship program. A Washington State Apprenticeship Council completion certificate is the only acceptable documentation for graduation. The only way to get credit for training hours while enrolled in an apprenticeship program is through the Apprenticeship Training Director (or Apprenticeship Chairman, Secretary, etc., if there is no formal Training Director). The Training Director has the ability to report electrical training hours to the department on an Affidavit of Experience during the apprenticeship. Some Training Directors do not submit training hours for apprentices because apprenticeship programs often require more on-the-job experience than the minimum on-the-job experience required for non-apprentice trainees.

## ● Supervision Requirements For Trainees

Trainees working for an electrical contractor must be appropriately supervised by a properly certified electrician not less than 75% of the total time on each jobsite or 100% of the time for certain specialty contractors (e.g. 03A, 06B, 07A, 07B, 07C, 07D, 07E, and 10). If an L&I inspector finds a trainee working without supervision on a jobsite, the inspector will give the trainee an opportunity to provide evidence to document the proper supervision is being provided. This will come in the form of a document called Electrical Trainee Supervision Statement.

This legal document must be filled out and signed by both the trainee and the supervising electrician and returned to the inspector. If the Electrical Trainee Supervision Statement is not returned within 24 hours, the trainee, electrical contractor, and assigned administrator/master electrician may receive a civil penalty for the trainee working without proper supervision per RCW 19.28.161(3). Both the trainee and supervising electrician must attest to the proper supervision. If the document is fraudulent, additional civil penalties may be assessed.

## ● WAC Revision Proposals

WAC 296-46B is being revised. Since all the proposed changes are administrative rather than technical, the Technical Advisory Committee will not be convened. Stakeholders may comment on proposed changes during the public comment period and the public hearing tentatively scheduled for July 29th in Tumwater. The rule's targeted effective date is in late September.

### Personal Protection Equipment and Knowledge Saves Lives

Whenever you enter a jobsite you should always ask yourself:

- Am I wearing my hardhat, safety glasses, hearing protection, appropriate clothing, and safety shoes or boots?
- Do I know what the potential hazards are and how to recognize them?
- Should I re-assess the potential hazards as I enter different areas or situations on this jobsite?
- Where is the nearest first aid kit, fire extinguisher, and telephone?

### ● WAC Proposal – Distance Learning Continuing Education Classes

A WAC proposal will require distance learning class applications (i.e. Internet and correspondence) to demonstrate that the course includes the same or reasonably similar information content as a classroom course with similar clock hours. The application must also demonstrate how the number of requested clock hours was determined and monitored by the sponsor. Basing distance learning courses on the actual clock hours necessary to complete the course will ensure that students are actually engaged in their course material for the number of hours being credited. For Internet courses, sponsors must use software that tracks time based on when a student is actively engaged in the course material.

This proposal will align the requirements for distance learning courses with those used by other state agencies. All currently approved distance learning courses will be allowed to remain in use until they expire. All new distance learning classes will be required to demonstrate that they meet the requirements of clock-hour based distance learning.

### ● First Aid And Safety Classes

The WAC proposal includes a clarification that all classes must be approved by the L&I Electrical Program before continuing education credit is granted. In the past, the Electrical Board has allowed First Aid classes to be allowed without review. Upon the effective date of the WAC revisions, all classes, including First Aid must have L&I approval and the course sponsor must use the on-line roster reporting system. In addition, the board has asked that First Aid classes be limited to a maximum of 4 hours of credit towards the individual's total continuing education requirement.

Workplace safety classes such as NFPA 70E – Standard for Electrical Safety in the Workplace are limited to a maximum of 12 hours of credit towards the individual's total continuing education requirement. These classes are not considered to be First Aid.

### ● Current Policy Change And WAC Proposal – One-Line Diagram And Calculations For Alternate Energy Installations

There is common language in WAC 296-46B-445 (Wind Driven Generators) and WAC 296-46B-690 (Solar Photovoltaic Systems) which require the installer to submit installation design documents to the inspector at the time of the inspection request. We have found that submittal before the inspection is inefficient and difficult for both the department and the installer.

We now allow those documents to be provided on the jobsite at the time of inspection. This policy change will be formalized in coming WAC revisions.

The installer must leave the required documents at the jobsite in a weather resistant plastic bag or equivalent protective container for the electrical inspector to review upon arrival at the jobsite. When the electrical inspector leaves, the documents will be left in the container available for the next person (i.e. building official, owner, etc.) that needs the documentation.

### ● New/Replaced Receptacles On An Existing Residential Branch Circuit Must Be Tamper-Resistant

NEC 406.11 requires all dwelling unit 125 volt 15 and 20 ampere receptacles to be tamper-resistant. If an existing branch circuit is extended to allow for the addition of a new receptacle(s), the newly installed receptacle(s) must be tamper-resistant. Except when using a non-grounding type receptacle, receptacles that are replaced in an existing circuit must also be tamper-resistant.

### ● Electrical Question of the Month

**This Month's Question:** For a 240V, 3-wire circuit, what is the minimum branch-circuit load allowed for a 13.25 KW household electric range installed in a dwelling unit? **A)** 9275 watts, **B)** 8800 watts, **C)** 8000 watts, **D)** 6160 Watts

**Last Month's Question:** Which of the following types of electrical installations are covered by the NEC? **A)** ships, **B)** above-ground mining machinery, **C)** railway rolling stock, **D)** none of the answers. The answer is: **D)** [NEC 90.2(B)(1), (3) and Federal Mine Safety & Health Act of 1977, Public Law 91-173, as amended by Public Law 95-164].



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 5

May 2009

## ● Administrative Changes Only To The WAC In 2009

L&I has begun the process to change several administrative sections of WAC 296-46B. At their April meeting, the Electrical Board approved the department's recommended changes. Because the proposed changes are of an administrative nature, and to avoid the expense and stress on the program's resources the Technical Advisory Committee will not be convened. Stakeholders can comment on proposed changes during the public comment period and hearing.

## ● Requirements For Electrical Equipment

RCW 19.28.010(1) requires all electrical equipment to be manufactured to an applicable electrical safety standard. WAC 296-46B-010(8) clarifies that electrical equipment must be:

- Manufactured to applicable electrical safety standards recognized by the department (Note: A variance request must be submitted for this approval. Manufacturer documentation of standards for each component will be required before approval will be granted.); or
- Approved by listing or field evaluation by an L&I approved electrical testing laboratory. Contact information for all approved electrical testing laboratories is available on our website at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/Install/ProdTest/default.asp>.

There is a difference between a 'Listed' and 'Recognized' mark. The marks to the right are some of the more common 'Listing' marks used in Washington. A listing mark will always be accompanied by the product name (e.g. 'portable lamp', 'industrial control panel', etc.) to help you in ensuring that the listing is appropriate to the use of the product.

You may find that some of the individual components within a listed product have an Underwriters Laboratories (UL) recognized component mark (backwards *UR* shown below). UL says, "Some manufacturers may claim

*that because the components are UL recognized, the product in which they are assembled meets all the necessary requirements. But that's not necessarily the case, because the UL Recognized Component Mark means that the component alone meets the requirements for a limited, specified use...UL's Component Recognition Service covers testing and evaluation of component products that are*

*incomplete or restricted in performance capabilities. These components will later be used in complete end-user products or systems Listed...These components are not intended for separate installation in the field. They are intended for use as components of complete equipment...Component/end-product compatibility is the critical link between certification of a component and certification of the end-product in which the component is used."*

## ● Air Compressor Marking Requirements

Air compressor manufacturers do not typically list their products to the UL 1450 standard for compressors. They often use a mix of listings, recognized components, and other standards when building their equipment. UL 1450 is an encompassing standard that can be used for listing or field evaluating an air compressor.

But because compressors are often manufactured in multiple configurations (e.g. tank mounted, skid mounted, and with multiple accessories, etc.) only a very few manufacturers use UL 1450. If the compressor is not listed to UL 1450 by an approved electrical testing laboratory, the inspector has only two options available. The equipment must either be approved by field evaluation or by a variance request certifying that all of the compressor's components have been manufactured and installed in accordance with all applicable standards. All variance requests will be evaluated on a case-by case basis

### Safety Tip of the Month!

Outdoor electrical cord connected power tools and other appliances should only be used when you have ensured that all of the flexible cords are free of cuts and abrasions that may expose live conductors. GFCI protection is essential outdoors.

Please don't let warm outside weather diminish your electrical safety judgment.



before approval. A variance request is site specific. Variances cannot be applied to multiple installations. Listing is always the preferred method of documentation that the equipment is appropriate.

### ● A Third Engineering Evaluation Firm Has Been Accredited To Review Industrial Equipment And Wind Turbines

David Picatti of Picatti Bros. Inc. is now approved to perform the evaluation/review of unlisted industrial utilization equipment. Mr. Picatti joins the other two approved engineers: Arthur Stokes of Parker Messina & Associates and C. Sankaran of Power Science Engineering who are both based in the Seattle/Tacoma area.

While all approved engineers are able to work anywhere in the state, David Picatti, who is located in Yakima, is the first engineer based in Eastern Washington to seek and attain approval. Contact information for all the approved engineers can be found at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/Install/ProdEngineer/default.asp>

### ● When Will The Electrical Exams Be Revised To The 2008 National Electrical Code?

We are asked this question on a regular basis. Late summer 2009 is the current target date for implementing electrical exams based on the 2008 NEC. If you are an exam candidate, this will not affect your exam preparations. Certification exam questions do not change much with a new NEC edition. We make every effort to remove questions from examinations that are Code version dependent. New or altered NEC definitions or load calculation details are exceptions that may be version dependent.

All exam questions are based on basic safety, code, electrical theory, and state electrical law and rules. We expect electrician exams to verify entry-level ability to work without supervision. This skill includes the ability to use the installation standards (open-book use of the NEC, law, and rules) to solve problems that may be outside the worker's actual hands-on experience. We intentionally do not load certification exams with brand new 2008 Code revisions. In our system, staying current on new NEC changes is not dependent solely upon the certification exams, but is continued by mandatory continuing education for electricians.

Most changes in the exam database are reference updates for specific questions that are relocated within the code. We are being especially careful in modifying questions and references this Code cycle because we are migrating all of the data from the old LaserGrade system into the new PSI test platform. PSI acquired LaserGrade last year and we have been gradually making the complete transition to the more advanced PSI system.

When the transition is complete, the administrator and electrician exams will have the same basic "blueprint" as the current exams and the exam "time allowed" will remain the same. The similarities then end. The questions in the item bank will be statistically analyzed and the PSI system will be able to generate a unique, randomized, test for each candidate while maintaining standards of content and psychometric equivalence.

A fixed number of exam forms with static question items on each will become obsolete in the electrical program exams. People who "harvest" questions from exams to sell to individuals who fear exams will soon have to memorize all of the several thousand questions in our database. In our open-book exam format any exam candidate should do better if they primarily spend their time learning to effectively navigate the NEC, WAC, and RCW. For most of us, our preparation for our first electrical certification exam becomes the foundation on which we build our careers as safe, competent, professional electrical workers.

### ● Electrical Question of the Month

**This Month's Question:** Which of the following types of electrical installations are covered by the NEC? **A)** ships, **B)** above-ground mining machinery, **C)** railway rolling stock, **D)** none of the answers.

**Last Month's Question:** Conductor fill including splices cannot exceed \_\_\_% of the area within a surface non-metallic raceway where the cover is accessible and capable of being opened in place after installation. **A)** 53%, **B)** 60%, **C)** 75%, **D)** 0% The answer is: **C) 75%** [NEC 388.56].



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 4

April 2009

## ● We Are Recognized As An Electrically Safe State

Mike Holt a well known trainer and member of the NFPA code making panel(s) has compiled an analysis conducted by his firm which rates and assigns a safety grade to each of the 50 states. Washington did very well when compared to other states. In fact, only three states scored higher. This is an indication that we are doing things right. So why is it that we've distinguished ourselves from the rest of the country?

Clearly, the citizens of the state of Washington have placed a priority on safety for electrical equipment and installations. This is best accomplished through a highly skilled team of licensed electrical contractors using certified electricians and trainees who install their electrical work to established and well-defined standards. Verification is done with electrical safety inspections by competent city and state inspectors enforcing these adopted safety standards. As the largest "authority having jurisdiction" in Washington L&I has been a major contributor toward this distinction:

- We have comprehensive coverage across Washington with 22 field offices from Port Angeles to Pullman. Our offices are staffed by customer service and inspection teams that know how to find solutions for our customers.
- Our highly experienced inspection workforce is in the field every day responding to requests for inspection of permitted electrical work responding within 24 hours for 90% of inspections requested. Our primary focus is to ensure public safety. Our inspectors are given the latitude to use their knowledge and experience to make situational judgments about electrical safety risks when inspecting. Our highly specialized Electrical Compliance Outreach Regulation and Education (E-CORE) team along with the electrical field inspectors, continually work to find and expose the illegal activities of the underground economy.
- Customers, stakeholders, and inspectors are supported by our Specialty Compliance Services electrical staff at our Tumwater headquarters, which include the Equipment Evaluations & Continuing Education, Licensing & Certification, and Audit & Citations teams. We process tens of thousands of applications and files each year for licenses, certificates, classes, and laboratory approvals. The Chief Electrical inspector, supported by technical and administrative specialists, is responsible for the electrical program's technical and enforcement policy, leadership, and quality assurance.

## ● The Previously Evaluated Equipment List Is Available On Our Website

A list of Industrial utilization equipment previously reviewed and approved by an accredited engineer has been compiled and is maintained by the department on our electrical Web site under the link to "Installation Information". See WAC 296-46B-903 for a description of the type of industrial utilization equipment eligible for engineering evaluation.

The department does not regulate the pricing for engineering evaluation services. The customer generally sees a significant reduction in costs for their engineer equipment evaluation when an approved engineer has previously evaluated and labeled the same model of equipment in Washington. The secondary evaluation is made to ensure the equipment is the same (identical) equipment and it has not been altered, modified or damaged.

If you are considering purchasing equipment to perform a specific manufacturing task or process (e.g. milling machine, wine making equipment, bottling or packaging equipment, etc.) you may find it on the list. If your customer has specialized manufacturing equipment that is likely to qualify for engineering evaluation, you should check the "Reviewed and Approved Industrial Utilization Equipment List" first. It could save your customer money. The list can be found at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/Install/ProdEngineer/default.asp>

### Safety Tip of the Month!

When installing or using listed or labeled equipment it is important to always follow the manufacturer's instructions. This is particularly true when choosing a light bulb for the light fixture in your home. Not only can an over-sized bulb shorten the life span of the light fixture, it can build up excessive heat which can lead to equipment failure or even fire.

## ● Expired Electrical Permits That Have Had No Inspection Request

It is important to make certain your work is inspected. To fulfill our mandate of Keeping Washington Safe, we ensure that all appropriate inspections are made. An inspection request must be made when: within three business days of fully completing the job or within one business day after energizing any work (see WAC 296-46B-900(10)(a)). Progress inspections may also be requested for: cover, service, etc.

We have been finding many expired permits where an inspection request has never been made. The permit purchaser has the responsibility of ensuring the work is properly completed and that an inspection request is made. Failing to request the inspection puts the permit purchaser and consumers at risk. We have been working to ensure that all inspections are requested and made.

If the permit purchaser has let the permit expire without the appropriate inspection, a new permit must be purchased and an inspection requested. In addition, the permit purchaser is likely to receive an electrical citation(s) for failing to request the inspection. Be proactive and avoid these problems by verifying the inspection status of your permits before compliance action is necessary. Most permits need at least a progress inspection shortly after the permit is purchased. It is the permit purchaser's obligation to ensure inspections are requested.

Inspection history and information is available for every permit by clicking on the "Permit, Fees, and Inspection" button on the Electrical Program website's homepage:

<http://www.lni.wa.gov/tradeslicensing/electrical/>.

## ● Appeals Of Non-Compliance Citations

RCW 19.28.131 states that any penalty is subject to review by appeal to the Electrical Board. Be absolutely sure that you have not violated the intent of the electrical law or rules before initiating an appeal. Many times appellants just want their day in court, to be able to tell their side of the story. This may be an expensive undertaking, since very few citation appeals are actually won by the appellant (i.e. less than 1% of all appeals).

The Electrical Board assigns the initial appeal hearing to an Administrative Law Judge (ALJ). The appellant, their attorney (if they choose to have one) and any witnesses will need to appear at the hearing. The ALJ will only rule on whether citations were properly issued under the electrical law (RCW 19.28) and rules (WAC 296-46B). There is no consideration of penalty amounts, prior history, extenuating circumstances, or electrical technical issues. A citation appeal hearing is not like municipal traffic court where the judge may have the ability to reduce a fine.

A \$200 appeal bond must accompany all appeals. An appeal is considered to be for each entity that received a citation, for each type of violation. For instance, if XYZ Electric receives 3 citations for failing to buy a permit and wants to appeal, the appeal bond would be \$200. If a citation was also issued for failing to call an inspection, the total appeal bond, for all 4 citations would be \$400. If the appeal is lost the bond is forfeited to offset the hearing costs and the full penalty amount of the violation must be paid. The bond is not subtracted from the penalty amount. If you win the appeal, the bond is returned and the citations are voided.

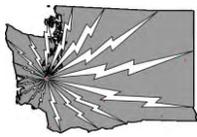
## ● Circuit Extensions Allowed By Class B Permits

120V, 20A circuits are allowed to be extended as long as the contractor's scope allows them to do so. You must remember that a contractor may use no more than two class B labels per week on any individual jobsite (i.e. address).

## ● Electrical Question of the Month

**This Month's Question:** Conductor fill including splices cannot exceed \_\_\_ of the area within a surface non-metallic raceway where the cover is accessible and capable of being opened in place after installation. **A) 53%, B) 60%, C) 75%, D) splices not allowed**

**Last Month's Question:** A utility interactive inverter must mechanically disconnect the connected secondary power source when the primary power source becomes de-energized? **A) True, or B) False**  
The answer is: **B) False** [NEC 705.40 Exception].



## ● Focusing The Electrical Program During The Recession

The economic downturn in construction activity led to a significant drop in revenue for L&I's Electrical Program, forcing a reduction in the number of inspectors. On March 31<sup>st</sup>, the program will be eliminating 25 inspector positions across the state. With 20 percent fewer inspectors, we will not be able to continue to meet our goal of conducting all inspections within 24 hours. There may be slight delays in getting the inspections in some areas of the state. We know how important a timely inspection is to getting the project completed on time, and we will make every attempt to do all inspections as quickly as possible.

We will still be doing our best to improve public safety and will have more focus on the underground economy and anyone who creates an unlevel playing field for electrical contractors who follow the law.

The construction downturn means more people will choose to do their own electrical work and remodeling. All property owners need to know that an electrical permit and inspection is required for most new, remodeling, and maintenance electrical work to ensure the work conforms to state safety codes and to protect their ability to get insurance or to refinance or sell their property. L&I is increasing its outreach and education efforts to raise awareness of electrical safety and to improve compliance with the permit and inspection requirements.

A poor economy and high unemployment means more people are moving into the underground economy in search of ways to make money or cutting costs by bypassing permits and inspections. This puts the public at risk from unsafe electrical installations and takes work away from electrical contractors who follow the law. As a result, L&I is expanding its outreach and compliance efforts statewide with a focus on:

- Targeting unlicensed electrical contractors and uncertified electricians.
- Identifying electrical work that has not been permitted and inspected.

## ● Reciprocity And Temporary Electrician Certificates Phased Out

The Electrical Board, at their January 29<sup>th</sup> meeting, weighed all the pros and cons of reciprocity and temporary certification and made a nearly unanimous recommendation to withdraw from all reciprocal agreements and end the use of temporary certification. After the recommendation, L&I stopped issuing temporary electrician certificates on February 23<sup>rd</sup> and notified all reciprocal states that beginning March 31<sup>st</sup>, we will no longer honor requests for electrician certification reciprocity.

Over the years, L&I has removed all the obstacles to gaining electrician certification that existed when reciprocity began in the early 1990s. It used to take months to get an electrician certification in Washington when coming from out of state. Today, it is easy for a qualified candidate to have their certificate within a few days, even before moving to Washington.

Having all electrician candidates take the Washington exams will help ensure that the candidate has up to date knowledge of the electrical code and Washington's laws and rules. Taking the Washington exam requires little investment from the candidate (i.e. 4 hours and the \$75 exam fee). Exams are available worldwide through our exam administrator, PSI. PSI offers exams 5 days per week with immediate results and the ability to immediately schedule a follow-up exam if necessary. Certificates are issued within three days of examination completion. The only hurdle for a candidate will be taking and passing our electrician examination.

### Safety Tip of the Month!

Injury statistics show that the use of ladders presents many hazards. Injuries involving ladders frequently cause permanent disability.

- Always, use the right ladder for the job.
- Get help with heavy or long ladders.
- Make certain your footing is good (e.g. avoid ice, mud, and other slippery conditions).
- Review the DOSH ladder bulletin at: <http://www.iapa.ca/pdf/FreeDownloads13-Ladders1.pdf>

### ● When Will I Get My inspection?

Requests for inspection must be made no later than: three (3) business days after completion of the electrical installation, one (1) business day after any part of the electrical installation has been energized, or before the installation is covered, whichever occurs first.

You may call any L&I office to request an inspection, but this may delay your inspection request. Requests made online before midnight will be available to the inspector the next morning. To request an electrical inspection online, go to:

<http://www.lni.wa.gov/TradesLicensing/Electrical/FeePermlnsp/default.asp>

Because of varying workloads, the response time for an inspection may vary. Most inspections are performed within 1 working day after the request is received. In some areas, inspections may be delayed because of the large geographical area covered by the inspector or short staffing. If any special arrangements are needed to arrange access to allow the inspector to make the inspection, you must contact your inspector between the hours of 8 a.m. and 8:30 a.m. prior to the inspection. Special arrangements could include: access to the site when no one is present, request for specific inspection days or times, or other needed arrangements.

Inspectors will not enter any work site, when minors are present, unless the owner or the owner's adult representative is present.

The electrical inspector may make an appointment, depending upon his/her workload. Keep in mind that appointments may be made for a.m. or p.m. only during normal working hours. Specific times are not set for inspections.

### ● Who Purchases The Electrical Work Permit?

The electrical contractor must purchase an electrical permit for his/her part of the electrical work. If the owner or another contractor does electrical work, each must purchase a separate electrical permit for the portion of the work they are doing. This may appear as if permits are being duplicated for the same work. That is not the case. Each installing entity is required to get a permit and inspection for their part of the electrical work. Without the separation of permits, it would be impossible to determine who is responsible for the work done.

Getting the permit: You may buy your permit at any L&I office or online using a credit card at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/FeePermlnsp/default.asp>

### ● New, Rebuilt, Or Remanufactured Hot Tubs Must Have The Proper Label

RCW 19.28.010(3) says, "*Electrical equipment associated with spas, hot tubs, swimming pools, and hydro-massage bathtubs shall not be offered for sale or exchange unless the electrical equipment is certified as being in compliance with the applicable product safety standard by bearing the certification mark of an approved electrical products testing laboratory.*"

There is no distinction between new, rebuilt, or remanufactured equipment. In order to maintain the original listing of the equipment, only original equipment manufacturer parts or OEM recommended parts may be used during a repair, rebuild, or replacement. If non-OEM parts are used, the equipment must be field evaluated by an L&I approved electrical testing laboratory.

When rebuilding is allowed by accredited electrical testing laboratories the product includes the word "Rebuilt", "Remanufactured", or "Reconditioned" as part of the product listing mark. Though listed rebuilt swimming pool pumps or spa pumps are available as OEM parts, there are no complete spas, hot tubs, or hydro-massage bathtubs products identified with this rebuilt listing mark today.

### ● Electrical Question Of The Month

**This Month's Question:** A utility interactive inverter must mechanically disconnect the connected secondary power source when the primary power source becomes de-energized? **True** or **False**.

**Last Month's Question:** Where EMT is installed on the roof of an office building for the purposes of supplying power to an HVAC heat pump, is an equipment grounding conductor required to be provided within the raceway? **A)** Yes, **B)** No, **C)** It's allowed, but not required. The answer is: **A)** [WAC 296-46B-358(2)].



# ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

Vol. 12 No. 2

February 2009

## ● Three Electrical Inspectors Are Recognized For Excellence

“Electrical Inspector of the Year” and “Electrical Inspector Supervisor of the Year” awards were presented to three of our finest Labor and Industries electrical inspectors by Chief Electrical Inspector, Ron Fuller (left center) at the January 29<sup>th</sup> Electrical Board Meeting.

Dave Campbell (right center), was chosen as Labor and Industries Electrical Inspector of the Year. Jim Hinrichs (far right), and Steve Thornton (far left), will share the award for Electrical Inspector Supervisor of the Year. All three recipients are quick to point out that they would have no success if it weren't for the tremendous support and efforts from their inspectors and support staff.



Dave Campbell, Lead inspector in the Vancouver office, has worked for the department for over ten years. He is well respected by his peers and supervisors alike. He goes way beyond that which is required and is quick to volunteer for special projects and community outreach opportunities. Always a team player, Dave is well known for always being available to help out when help is needed.

Jim Hinrichs, the Everett office supervisor, has worked with the

department for twenty-two years and is the senior supervisor. He piloted the highly successful SAFES program which paved the way for the E-CORE program (Electrical Compliance, Outreach, Regulation and Enforcement). Highly respected by his peers for his knowledge, experience, and tenacious spirit, Jim has dedicated his life to the pursuit of excellence in the electrical industry. Jim has been a role model in developing an extremely efficient and effective inspection workgroup. His accomplishments and desire to improve the electrical program are indisputable.

Steve Thornton, the Vancouver office supervisor, has worked for the department for over fourteen years. Steve is highly regarded by his staff and peers, and has a sterling reputation with his customers. When asked to describe Steve his fellow supervisors used terms like: knowledgeable, reasonable, great people skills, loves what he does. Like Jim, Steve's primary concern is the success of his inspectors, which is evidenced by their consistency and success in ensuring safe, compliant installations, and combating the underground economy.

## ● The Correction Reduction Initiative Is Being Expanded

Corrections cost time and money for contractors and inspectors alike. The Correction Reduction Initiative was first introduced in June of 2006 with the goal of reducing the number of corrections written to contractors. All corrections indicate a problem with the work and require return trips to the jobsite for both the contractor and inspector.

In July, we identified and monitored a group that was consistently receiving the most corrections (i.e. 20% of contractors who received the most corrections per inspection and had at least 24 inspections in FY08.

The Correction Reduction Initiative has been very successful, resulting in much fewer corrections being written to the identified contractors. We are now going to expand the initiative and focus on all contractors who received at least twenty-four inspections in the twelve month period between July 1, 2007 and June 30, 2008, and who received more than the average number of corrections as compared to all other electrical contractors within the state. Electrical contractors within the group will receive an

### Safety Tip of the Month!

Always purchase an electrical work permit before you start your electrical project.

Purchasing a permit ensures an electrical inspector will review your work for safety and code compliance.

ongoing monthly performance report, which is meant to help them keep track of how they are doing month to month, permit by permit.

### ● Pop-up Receptacle Outlets For Residential Kitchen Countertops Must Be Listed

Receptacles serving dwelling unit countertops are required in kitchens, pantries, breakfast rooms, dining rooms, and similar areas. In the last few years “pop-up” receptacles have been appearing on the surface of residential kitchen countertops.

In addition to the listed GFCI protected receptacle, the fixture/box that houses the device must also be listed or the package must be listed as an assembly. If the unit is going to be installed in a kitchen countertop, the manufacturer’s installation instructions must indicate it is suitable for this environment.



### ● Third-Party Evaluation Is Required For Unlisted Electrical Equipment

In order to meet the minimum electrical safety standards for installations, all materials, devices, appliances, and equipment, not exempted in chapter 19.28 RCW, must conform to applicable electrical product standards recognized by the department, be listed, field evaluated, or in specific cases engineer reviewed. See WAC 296-46B-903(5) and (6) for eligible industrial utilization equipment and details of the engineering review process.

The electrical inspector can only approve equipment for use if it meets the one of the following third-party identification criteria:

- It arrives on the job site listed and identified with the certification mark of an L&I approved electrical products testing laboratory. The mark will identify the appropriate product category for the equipment. There may be listed individual components within the assembly but they are only a part of the product.
- Field evaluated with a field evaluation label applied by an L&I approved electrical testing lab.
- Engineer evaluated with the engineering evaluation label applied by an L&I approved engineer.

A third-party evaluator can have no organizational, managerial, financial, design, or promotional affiliation with manufacturers, suppliers, installers, or vendors of products covered under its certification or evaluation programs. Only laboratories or engineers approved by the department are allowed to perform field or engineering evaluations. “Approved” means the evaluator has met the requirements of WAC 296-46B, and is authorized by the department to evaluate electrical products that are installed in Washington. A list of approved evaluators can be found on our Web site at:

<http://www.lni.wa.gov/TradesLicensing/Electrical/Install/default.asp>

### ● February 15<sup>th</sup> The Department Will Resume Normal Enforcement Of Tower Cranes

A voluntary compliance effort was initiated by the department for lack of third-party electrical evaluation and certification of tower cranes erected prior to December 15, 2008. This voluntary effort will extend through February 14, 2009. All tower cranes erected on or after December 15, 2008, are expected to carry the appropriate third-party electrical certification identification mark or evaluation label before they are put into operation.

Beginning February 15, 2009, L&I’s Division of Occupational Safety and Health (DOSH) will resume normal enforcement when construction tower crane electrical components do not have the required third-party evaluation. If electrical components are not properly evaluated and certified, DOSH will issue citations with possible monetary penalties. In all cases where inspections are performed, if DOSH determines that there exists an imminent danger to workers or the public, immediate correction will be required prior to continuing operation.

### ● Electrical Question of the Month

**This Month’s Question:** Where EMT is installed on the roof of an office building for the purposes of supplying power to an HVAC heat pump, is an equipment grounding conductor required to be provided within the raceway? **A) Yes, B) No, C) It’s allowed, but not required.**

**Last Month’s Question:** In crawl spaces, can a nonmetallic sheathed cable with three No. 12 AWG conductors be run perpendicular to the direction of the joists, and be secured directly to the lower edges of the joists? **A) Yes, B) No, C) Yes, if on running boards.** The answer is: **A) [WAC 296-46B-334(6)].**

Electrical Section Internet Address: <http://www.Lni.wa.gov/TradesLicensing/electrical> Page 2 of 2

This document is available in alternative formats to accommodate persons with disabilities. For assistance, call 1-800-547-8367. (TDD/TTY users, please call 360-902-5797.) Labor and Industries is an Equal Opportunity employer.



## ● The 2008 National Electrical Code Is Now In Effect

Beginning December 31<sup>st</sup> 2008, all new electrical permits are subject to the rules and requirements of the 2008 National Electrical Code (NEC). The 2008 NEC is adopted in the revised Washington Administrative Code (WAC) chapter 296-46B – Electrical Safety Standards, Administration, and Installation.

While these two documents are meant to work together to help electricians understand and interpret the requirements, they will sometimes conflict on a particular issue. It is important to remember that when there is a disagreement between the two standards, the WAC will always prevail over the NEC.

Printed copies of the revised WAC 296-46B can be purchased at any L&I office for \$5.00 per document. Multiple copies can be ordered by calling the Electrical Program at (360) 902-5269.

There is an Adobe .PDF format version of the new rules on our Web site for printing or downloading at: <http://www.lni.wa.gov/TradesLicensing/Electrical/LawRulePol/LawsRules/default.asp>

## ● New Cable and Conduit Clearances Under Metal-Corrugated Sheet Roof Decking

Roof decking material will often be repaired or replaced after the initial raceway or cabling system is installed. This can result in the penetration through the roof decking of screws or other mechanical devices designed to provide “hold down” strength of the waterproof membrane or roof insulating material.

NEC 300.4(E) has a new requirement all cables and raceways, except rigid and intermediate metal conduit, installed in exposed or concealed locations under metal-corrugated sheet roof decking be installed and supported so the nearest outside surface of the cable or raceway is not less than 38 mm (1½ in.) from the nearest surface of the roof decking.

## ● Tower Cranes Are “Equipment” And Must Meet Electrical Safety Requirements

Crane failure due to mechanical or electrical problems can cause loss of life and significant property damage. Like other types of electrical equipment tower cranes must be listed or field evaluated. Washington’s electrical and worker safety laws and rules require third-party safety evaluation and labeling of all electrical equipment on tower cranes operating anywhere in the state.

When a state or a city electrical inspector finds a crane that has not had the third-party evaluation, they issue a correction notice to the crane installer requiring the safety evaluation to be done. Once a correction notice is issued, the owner of the crane must contact an accredited testing laboratory and make arrangements for the laboratory to field evaluate the equipment. Until the crane has the proper evaluation and label, the crane should not be used.

If the crane owner needs to operate the crane during the field evaluation process and the crane is in L&I’s electrical inspection jurisdiction, the owner may request permission to operate in writing to the Chief Electrical Inspector. L&I typically grants approval to operate on a temporary basis based upon the time needed for the laboratory to complete the field evaluation. If the crane is in a city’s electrical inspection jurisdiction, the owner must request permission from the city to energize any electrical equipment during the evaluation period. If the crane is in a city’s jurisdiction, it is up to the city to grant or not grant this approval.

For more information you should visit our “What’s New for Electrical Professionals” Web page which contains a link to the Tower Crane Electrical Safety Requirements:

<http://www.lni.wa.gov/TradesLicensing/Electrical/WhatsNew/default.asp>

### Safety Tip of the Month!

Portable heaters can help take the chill from areas of your home, but can be very dangerous if used improperly.

Approximately 1/3 of all house fires nationwide occur during the cold home season of December, January and February.

Stay warm and safe, and give space heaters clearance – at least 3 feet from anything that can burn, including little fingers!

**● Back-Fed Circuit Breakers Must Be Secured In Place With An Approved Device**

Circuit breakers that are marked "Line" and "Load" have been evaluated only for the terminations marked. Circuit breakers without "Line" and "Load" markings have been evaluated for terminations in either direction and are suitable for back-feeding a panelboard.

If suitable, plug-in type circuit breakers or plug-in type main lug assemblies in a panelboard are allowed to be back-fed with field installed ungrounded supply conductors per NEC 408.36(D). These devices are required to be secured in place by an additional fastener that requires a method other than a pull to release the device from the mounting means on the panel.

Only listed fasteners that are approved by the panelboard manufacturer for that purpose will be allowed as the required additional fastener for back-fed devices.

**● 2008 NEC Change Affects The Use Of Service Entrance Cable Type SE And USE In Interior Installations**

For interior installations of SE or USE cables, Article 338.10(B)(4)(a) refers the installer to the requirements for nonmetallic sheathed cable (Article 334, Part II) in both the 2005 and 2008 NEC. In the 2005 NEC, the requirements in Part II (334.80) relating to the ampacity of the cable were exempted for SE and USE used inside a building. That exclusion of 334.80 is gone in the 2008 NEC. Investigation of the 2007 Committee Report on Proposals shows intent of the Code Making Panel (CMP) 7 to limit final derated ampacity of SE and USE cables used in interior installations to that of a 60 °C rated conductor, just like NM cable.

We have been asked for further clarification of this issue for use of service entrance cables under the unique conditions allowed in NEC 310.15(B)(6) and Table 310.15(B)(6). In this application the rating of the SE and USE conductors is increased to a higher ampacity based on the diversity of load on any service or feeder conductors carrying the full load of an individual dwelling unit, as limited in 310.15(B)(6). Loads on such conductors are considerably less than the load calculated per Article 220. No restrictions on these long established Table 310.15(B)(6) ratings were supported by CMP 6, the panel responsible for Article 310. We will not restrict these table ratings any further (for interior installation) under these specific conditions of use.

**● Electrical Corrections Issued Are Now More Recognizable and Descriptive**

Along with the new NEC and WAC our inspectors have new mobile computer software that should add clarity to corrections written. During the 2005 NEC cycle the computer software limited the number of default (common) selections that were available to our inspectors when writing corrections. This meant inspectors had to add or edit corrections on the jobsite on a regular basis.

For the 2008 NEC we have increased the number of NEC and WAC references in the software. As a result the corrections you see written should look a lot like what you will see when you look them up in the Code or rules. The inspector still has some edit capabilities prior to printing the correction notice. This upgrade should make issued safety corrections easier to understand and reference.

**● Optional Standby Generator Circuits Must Utilize Required AFCI Breakers**

Bedroom circuits that require arc-fault circuit interrupters may be fed from secondary power sources, as in the case of a multi-circuit transfer panel fed from a generator. Whether fed from the service panel, generator transfer panel, or another source, the circuit must be protected with the required AFCI. The AFCI must not be bypassed.

**● Electrical Question of the Month**

**This Month's Question:** In crawl spaces, can a nonmetallic sheathed cable with three No. 12 AWG conductors be run perpendicular to the direction of the joists, and be secured directly to the lower edges of the joists? **A)** Yes, **B)** No, **C)** Yes, if on running boards.

**Last Month's Question:** What type of electrical permit is required for the replacement of a fuel dispenser at a gas station? **A)** Standard permit, **B)** Class B permit, **C)** Provisional permit, **D)** No permit is required because it is Class A basic electrical work.

The answer is: **A)** Standard permit [WAC 296-46B-901].