Question of the Month – According to the 2020 National Electrical Code (NEC), ground-fault circuit-interrupter (GFCI) protection is required for: A) 250-volt, 30-ampere dryer receptacles; B) 250-volt, 50-ampere range receptacles within six feet of a sink; C) all 125-volt through 250-volt receptacles in a finished dwelling basement; D) all of the above. See correct answer on Page 2.

WAC 296-46B Rulemaking Update

The process of revising the electrical rules is underway. The electrical board reviewed the First Draft of WAC 296-46B and provided advice to the department at their meeting on January 30, 2020 in Tumwater. All of the proposals the department will move forward in the process will be compiled shortly in a Second Draft and will be posted on the Rule Development section of our Electrical Laws and Rules webpage.

The next step will be filing the CR-102 rulemaking proposal, which will open the formal public comment period and announce details for a public hearing. Watch for updates in future editions of this newsletter and at the Rule Development section of our Electrical Laws and Rules webpage. For complete details about the process, see the October 2019 Electrical Currents Newsletter Special Edition.

You can also discuss proposals with the chief electrical inspector by attending a stakeholder meeting near you (see article below). If you need additional information or have any questions, you may contact Alicia Curry at 360-902-6244 or Alicia.Curry@lni.wa.gov.

Legislative Update

If you are part of the electrical industry regulated by L&I, lawmakers are considering bills that may affect you. These bills are not sponsored by L&I. You can get information about these bills by clicking on the hyperlinked bill number below. Review the bills and comment if you desire. A comment button is located below the bill number on each webpage. You may also contact your legislator to share your opinion about any legislation by visiting the legislative website at: http://www.leg.wa.gov/LIC/Pages/hotline.aspx.

House Bill 2330 – Requires various state agencies including L&I to issue a “recommended guidance statement” in lieu of formal enforcement actions or civil penalties for violations of laws and rules enforced by the agencies.

Senate Bill 6409 – Exempts manufacturers’ authorized engineers or factory-trained service technicians from electrical contractor licensing and worker certification requirements while working within the confines of industrial equipment.

Senate Bill 6327 – Requires the department to issue temporary permits in lieu of certificates of competency if an applicant holds a journey level or specialty electrician certificate from another state.

Electrical Contractors – Virtual Electrical Inspections Are Here

In a new service from L&I, you can now request a Virtual Electrical Inspection (VEI) on the same day at least 30 minutes in advance of when you need it.
VEI is a dependable inspection process, allowing contractors on the jobsite to interact with inspectors online on a mobile device using Skype. Here are some important points to keep in mind:

- To use VEI, you will need to download the Skype Application and create a profile.
- Use VEI for any electrical inspections that will take no longer than 15 minutes, and that do not involve service or final approvals.
- On the jobsite, make sure you have at least a 4G, LTE, or Wi-Fi connection on your mobile device.

“VEI benefits customers, who will have some predictability that an inspection will take place at a specific time,” said Steve Thornton, L&I Chief Electrical Inspector. “Besides saving time and money for contractors, virtual inspections will also lead to quicker follow-up inspections on corrections.”

Use Google Chrome to schedule your inspection for the day and time you want. You can learn more about VEI by visiting www.lni.wa.gov and search “Virtual.”

**Invitation to a Stakeholder Meeting Near You**

I am holding electrical stakeholder meetings across the state between January and May 2020. These meetings are an opportunity to talk in an informal setting. I want to hear how we can better serve you and help you stay informed of any regulations that might affect you and/or your business. Check the schedule and attend a meeting near you. Meetings are held from 6 to 8 p.m. at the locations listed below.

<table>
<thead>
<tr>
<th>2020 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>February 4 – Vancouver</strong> – L&amp;I Building – 312 E Stonemill Dr. Suite 120, Room C49</td>
</tr>
<tr>
<td><strong>February 25 – Tacoma</strong> – L&amp;I Building 950 Broadway, Orcas Room, 5th floor</td>
</tr>
<tr>
<td><strong>March 3 – Tukwila</strong> – L&amp;I Building 12806 Gateway Dr. South, Rm C30</td>
</tr>
<tr>
<td><strong>April 21 – Pateros</strong> – Howard’s on the River Event Center 233 Lakeshore Drive</td>
</tr>
<tr>
<td><strong>May 11 – Kennewick</strong> – Benton PUD Auditorium – 2721 West 10th Avenue</td>
</tr>
<tr>
<td><strong>May 14 – Pullman</strong> – Parks &amp; Recreation, 190 SE Crestview, Room 218</td>
</tr>
</tbody>
</table>

**Answer to Question of the Month:** D) All of the above. 2020 NEC 210.8(A) was revised to include GFCI protection for all of the above receptacles. GFCI protection rules were expanded to include all receptacles up to 250-volt in the specified areas.

**Ugly Picture of the Month:** If viewing this document online, click on the picture to open a larger image.

Don’t be like this guy. This dangerous act was performed along one of the busiest streets in town about six blocks from the L&I office. Fortunately for him, an L&I electrical inspector showed up before the guy fell off, and gave him some wise counsel on safe ladder use.
Question of the Month – According to the 2020 National Electrical Code (NEC) is a main-lug service panelboard consisting of up to six service disconnecting means in the same enclosure permitted? See correct answer on Page 2.

WAC 296-46B Rulemaking Update

The process of revising the electrical rules is underway. A Technical Advisory Committee (TAC), made up of a broad cross section of representatives from the electrical industry reviewed the proposals and provided advice to the department at their meeting on December 11, 2019 in Tacoma. We have compiled all of the proposals the department will present to the Electrical Board in a First Draft of WAC 296-46B. A copy of the First Draft is available by visiting the Rule Development section of our Electrical Laws and Rules webpage. The department will receive the advice of the Electrical Board regarding the First Draft at their January 30th meeting in Tumwater.

Before adoption of any rules, there will be formal opportunities to provide written comments or present testimony at a public hearing. Watch for updates in future editions of this newsletter and at the Rule Development section of our Electrical Laws and Rules webpage. For complete details about the process, see the October 2019 Electrical Currents Newsletter Special Edition. If you need additional information or have any questions, you may contact Alicia Curry at 360-902-6244 or Alicia.Curry@lni.wa.gov.

No L&I Electrical Inspections on January 8 – Statewide Electrical Inspector Training

Training for all electrical inspectors is happening on January 7 – 9, 2020. To relieve some of the impact, January 8 will be the only day attended by all L&I inspectors, no inspections will be performed that day. On January 7 and 9, inspectors will be available but at reduced capacity. We regret the inconvenience this causes, but we have found that a statewide approach improves consistency and is the most efficient use of our training budget. Please let your customers know and plan for inspections accordingly.

Electrical Contractors – Virtual Electrical Inspections Are Here

You can now request a Virtual Electrical Inspection (VEI) on the same day at least 30 minutes in advance of when you need it. VEI is a dependable inspection process allowing customers on the jobsite to interact with inspectors online using Skype on a mobile device. You can begin using VEI now for any electrical inspections that will take no longer than 15 minutes, and that do not involve service or final approvals. To use VEI, download the Skype Application and create a profile. On the jobsite, make sure you have at least a 4G, LTE, or Wi-Fi connection on your mobile device. Use Google Chrome to schedule your inspection on the day and time you want it. To learn more, search “virtual” at www.lni.wa.gov.

Big Changes Coming for Trainees and 01 Contractors – Apprenticeship Requirement

Substitute Senate Bill 6126 passed by the legislature in 2018 affects those training to become 01 general journey level electricians and those who employ them.

- Effective July 1, 2023, to be eligible for the (01) general journey level electrician examination, applicants must have completed a recognized (01) electrical apprenticeship program approved by the Washington State Apprenticeship Training Council (WSATC) or out-of-state equivalent.
- After June 30, 2023, unless working in a specialty, trainees must be registered apprentices. Apprenticeship programs may credit certain properly documented electrical experience on record with the department such as, 4000 hours...
required to obtain an electrical specialty certificate, military experience or completion of a two-year training school program. Students enrolled in a two-year program in the electrical construction trade are not required to be registered apprentices while gaining on-the-job training experience during an externship.

**Want to Sponsor An Apprenticeship Program?**

All sponsors for (01) general journey level electrician apprenticeship programs must adhere to Minimum Guideline Standards approved by the WSATC. You can request a copy by contacting apprentice@lni.wa.gov.

Registered apprenticeship programs start with the formation of an apprenticeship committee made up of industry members—both employers and employees.

The best way to get started is by contacting the apprenticeship customer service line at 360-902-5320. They will connect you with an apprenticeship consultant in your area. They are your best resource to help you identify which type of apprenticeship model best suits your company and then provide one-on-one consulting and on-site assistance to help you identify which program up and running.

**Invitation to a Stakeholder Meeting Near You**

I am holding electrical stakeholder meetings across the state between January and May 2020. These meetings are an opportunity to talk in an informal setting. I want to hear how we can better serve you and help you stay informed of any regulations that might affect you and/or your business. Check the schedule and attend a meeting near you. Meetings are held from 6 to 8 p.m. at the locations listed below. Please note the [date changes](#) for the Tacoma and Silverdale meetings.

<table>
<thead>
<tr>
<th>2020 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January 28</strong> – Tumwater – L&amp;I Building Auditorium - 7723 Linderson Way SW</td>
</tr>
<tr>
<td><strong>February 5</strong> – White Salmon – White Salmon Valley Library – 77 NE Wauna Ave</td>
</tr>
<tr>
<td><strong>February 26</strong> – Silverdale – L&amp;I Building 10049 Kitsap Mall Blvd NW Suite 100</td>
</tr>
<tr>
<td><strong>April 8</strong> – Everett – Snohomish County PUD – 2320 California St, Commission Rm</td>
</tr>
<tr>
<td><strong>April 22</strong> – East Wenatchee – Douglas County PUD conference room, 1151 Valley Mall Parkway</td>
</tr>
<tr>
<td><strong>May 13</strong> – Colville – Spokane Community College, 985 S Elm St., Classroom 132</td>
</tr>
<tr>
<td><strong>Late-May</strong> – Kennewick – exact date and location yet to be determined</td>
</tr>
</tbody>
</table>

**Answer to Question of the Month:** No. No more “main lug” services. 2020 NEC 230.71(B) has been revised to require the two to six service disconnecting means to be in separate enclosures or panelboards with a main service disconnecting means in each enclosure, separate vertical sections of switchboards, or in equipment where each service disconnecting means is located in a separate compartment such as a motor control center.

**Ugly Picture of the Month:** We receive many questions from folks at our electrical program mailbox, ElectricalProgram@lni.wa.gov about how to become certified electricians. This one raises a few questions. You can find information about becoming an electrician by searching “electrician” at www.lni.wa.gov.

Hi so I've worked in the electrical industry for about the last 10 years although I don't have any actual licensing. I want to get licensed so that my resume looks more attractive and I can get more work. What would I need to do in order to get that license?

Is it possible simply take a test being that I have so much experience? —
Question of the Month – According to the 2020 NEC, is an outdoor heat pump supplied by a 240-volt 30-ampere branch circuit installed at a dwelling required to have ground-fault circuit-interrupter (GFCI) protection? See correct answer on Page 2.

WAC 296-46B Rulemaking Update

The process of revising the electrical rules is underway. Rule proposals submitted during the open window – October 10, 2019 through November 15, 2019 are compiled and posted on Rule Development section of our Laws and Rules webpage.

The primary reason for rulemaking is the July 1, 2020 effective date of the recently published 2020 National Electrical Code (NEC). Rulemaking offers everyone an opportunity to propose amendments to the 2020 NEC rules to improve safety or clarity.

A Technical Advisory Committee (TAC), made up of a broad cross section of representatives from the electrical industry reviews the proposals and provides advice to the department. The TAC meets on December 11, 2019 in the Orcas Room of the Tacoma Rhodes Center, 949 Market Street, Tacoma at 9:00 a.m. The meeting is open to the public, but to efficiently consider all proposals, comments will be limited to appointed members of the TAC. After the TAC meeting, the Electrical Board reviews the rule proposals and makes further recommendations at their next regular meeting.

Before adoption of any rules, there are formal opportunities to provide written comments or present testimony at public hearings. See the Rule Development section of our Laws and Rules webpage for additional information about what happens next and to view the proposals.

For complete details about the process, see the October 2019 Electrical Currents Newsletter Special Edition.

If you need additional information or have any questions, please contact Alicia Curry at 360-902-6244 or Alicia.Curry@lni.wa.gov.

No L&I Electrical Inspections on January 8 – Statewide Electrical Inspector Training

Training for all electrical inspectors is happening on January 7 – 9, 2020. To relieve some of the impact, January 8 will be the only day attended by all L&I inspectors, no inspections will be performed that day. On January 7 and 9, inspectors will be available but at reduced capacity. We regret the inconvenience this causes, but we have found that a statewide approach improves consistency and is the most efficient use of our training budget. Please let your customers know and plan for inspections accordingly.

Invitation to a Stakeholder Meeting Near You

I am holding electrical stakeholder meetings across the state between January and May 2020. These meetings are an opportunity to talk in an informal setting. I want to hear how we can better serve you and help you stay informed of any regulations that might affect you and/or your business. Check the schedule and attend a meeting near you. Meetings are held from 6 to 8 p.m. at the locations listed below.
2023 National Electrical Code is Open for Public Input

Not happy with something in the 2020 National Electrical Code (NEC)? The 2023 edition is now open for public input! Anyone can submit a proposal to make changes to the NEC to be published in August 2022. The public input closing date is September 10, 2020.

To submit a public input using the online submission system, go directly to the National Fire Protection Association – NFPA 70 page using this link. Once on the NFPA 70 page, select the link “Submit a Public Input” to begin the process. You will be asked to sign-in or create a free online account with NFPA before using this system. If you have any questions when using the system, a chat feature is available, or contact NFPA by email or phone at 1-800-344-3555.

Answer to Question of the Month: Yes. 2020 NEC 210.8(F) is a new section that requires all outdoor outlets for dwellings, other than those covered in 210.8(A)(3), Exception to (3), that are supplied by single-phase branch circuits rated 150 volts to ground or less, 50 amperes or less to have ground-fault circuit-interrupter protection for personnel.

By the way, according to the NEC, an outlet is defined as a point on the wiring system at which current is taken to supply utilization equipment.

Ugly Picture of the Month: If viewing this document online, click on the picture to open a larger image. A power company lineman, investigating theft of power discovered this very creative and dangerous installation supplying a receptacle.
Question of the Month – According to 2018 NFPA 70E Standard for Electrical Safety in the Workplace, what are the 4 conditions where work on energized electrical conductors and circuit parts is permitted? See correct answer on Page 2.

Correction to September’s QOM Answer
There was a typo in the answer to September’s question of the month. The correct answer should have been three instead of two. An island countertop surface of 32 ft² would require three receptacle outlets per 2020 NEC 210.52(C)(2). Remember, a receptacle outlet, according to NEC 100 is defined as an outlet where one or more receptacles are installed.

You Can Help Write the Electrical Rules – WAC 296-46B Updates
Visit the Electrical Program Rule Development page of our website for details about how you can be involved in the rulemaking process. You can submit a proposal or apply to serve on the Technical Advisory Committee (TAC).

Until November 15, 2019, we will be accepting rule change proposals and applications for membership on the TAC. Complete details were published in the October 2019 Special Edition newsletter.

The reason we are opening the rules for revision is because the 2020 National Electrical Code (NEC), which will be effective in Washington July 1, 2020, was published in September 2019. Due to changes in the NEC, some sections of the WAC rules must be revised. We are accepting proposals to amend the rules based on new NEC requirements as well as giving interested parties the opportunity to propose any rule changes to improve safety or usability of the rules.

As part of the rulemaking process, L&I filed a preproposal (CR101) with the state Office of the Code Reviser last month. There will be opportunities to provide written comments or present testimony at public hearings. See the Rule Development page of our website for additional information about how to participate in the process, and to download the proposal form for 2020 WAC 296-46B Rule Changes.

If you need additional information or have any questions, please contact Alicia Curry at 360-902-6244 or Alicia.Curry@lni.wa.gov.

Make Sure Your Work is Inspected
It is important to make sure your electrical 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 within three business days of fully completing the job or within one business day after energizing any work – see WAC 296-46B-901(9)(a). A progress inspection must also be made before covering any portion of the installation. 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 takes place. Failing to request an 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 lets 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.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: Lni.wa.gov/ElectricalCurrents

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
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 visiting the Look Up a Permit or Inspection page of our website and looking up your permit information.

Your Permit May Require Additional Progress Inspection Fees

Permit fees are specified in WAC 296-46B-906. According to this rule, the total fee must not be less than the number of progress inspection (one-half hour) units times the progress inspection fee rate from subsection (8) – currently, $46.80. If more than one inspection is required for your permit, for example, a wall cover or ditch inspection plus a final inspection, and your original permit fee is less than $46.80 times the number of inspection trips, you may receive a notice of additional fees due.

Example: Installation of residential circuits supplying underground yard lighting and an irrigation pump will usually require two inspection trips (one for ditch cover, and one for inspection of the completed circuits. The residential circuit permit fee is $62.00, which does not cover the cost of two inspection trips. In this case, an additional fee of $46.80 will be required. A way to avoid this is to have the installation completed at the time of the ditch inspection. Any permit where the fee is less than $93.60 ($46.80 X 2) will only cover one inspection trip, and additional inspection trips will require additional progress inspection fees.

Is That Plastic Cut-in Box Approved to Support Your Luminaire?

Not all round cut-in boxes are intended to support luminaires. According to Underwriter’s Laboratories guide information for nonmetallic outlet boxes, a nonmetallic box intended for support of a fixture/luminaire weighing 50 lbs. or less is marked “FOR FIXTURE/LUMINAIRE SUPPORT” on the carton. Nonmetallic boxes and plaster rings have not been investigated for support of a ceiling fixture/luminaire unless marked for use in ceilings, walls, and with the weight of the product to be supported.

Answer to Question of the Month: 2018 NFPA 70E 130.2(A)(1) through (A)(4) Energized work shall be permitted:

(1) Where the employer can demonstrate that de-energizing introduces additional hazards or increased risk.
(2) Where the employer can demonstrate that the task to be performed is infeasible in a de-energized state due to equipment design or operational limitations. (e.g., voltage and ampere testing is not feasible in a de-energized state)
(3) ...on parts that operate at less than 50 volts where it is determined that there will be no increased exposure to electrical burns or to explosion due to electric arcs.
(4) Normal operation of electric equipment shall be permitted where a normal operating condition exists.

Ugly Picture of the Month:
If viewing this document online, click on the picture to open a larger image.

Here is a safety device that caused a safety hazard. Multiple exit signs had to be replaced due to overheating caused by incorrect lamps. Make sure to check the label on your exit signs and luminaires and use the correct size lamp.
SPECIAL EDITION

WAC 296-46B Revisions

● The Department Is Seeking Stakeholder Input for Proposed Rule Changes

The department is beginning the process of revising Washington Administrative Code (WAC) 296-46B – Electrical Safety Standards, Administration, and Installation rules to allow stakeholders the opportunity to propose amendments to the 2020 National Electrical Code (NEC) to be effective July 1, 2020. Any stakeholder in the electrical industry may make proposals for additions and/or revisions to WAC 296-46B. Proposals from stakeholders may be submitted from October 10, 2019 through November 15, 2019. 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 (RCW 19.28). Technical changes require evidence of a specific problem and substantiation that the proposal will provide a solution for that problem.

The department is responsible for development of 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.

A sample Proposal Form for 2020 WAC 296-46B Rule Changes is shown on page four of this edition. All proposals must be submitted using an electronic MS Word version of this form which is available on our Rule Development page at: Lni.wa.gov/ElectricalRules

Stakeholder proposals must be received from 12:01 a.m. October 10, 2018 through 11:59 p.m. November 15, 2019. Any proposal received before or after these dates will be rejected. All proposals must be made electronically using the form supplied by the department.

The submitter must submit a proposal(s) by sending the proposal form(s) as an email attachment to ElectricalWAC@lni.wa.gov during the submittal period shown above.

Proposed revisions should include the relevant existing text and should use 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).

Proposals not submitted according to these instructions will be rejected.

● Apply for the Technical Advisory Committee (TAC)

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

Persons interested in becoming TAC members must submit a letter of interest for specific positions to the Chief Electrical Inspector by email to ElectricalWAC@lni.wa.gov to be received from October 10, 2019 through November 15, 2019. The letter should state the position applied for (see TAC - Membership section below) and show constituency support for the prospective member. Include an email address and daytime phone number for the applicant. 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 35 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 designate an alternate to 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:

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

The TAC will operate on a majority basis. A majority vote of members in attendance in support of a motion 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. Public testimony will not be received during the TAC meeting. Opportunity for public comment will be provided at a later date (see below).

**2020 WAC Revision Process – Proposed Sequence of Events**

- **October 10 through November 15, 2019** – Accept proposals from stakeholders to amend or add to the existing WAC 296-46B.
- **October 10 through November 15, 2019** – Accept applications for TAC.
- **December 2019** – TAC meeting (exact date and location to be announced).
- **January 23, 2020** – Electrical Board review and recommendation on proposals.
- **February 2020** – File CR 102 – rule filing (opens the official required public comment period).
- **March 2020** – Public hearing(s).
- **July 1, 2020** – Revised rule becomes effective.

**General TAC – Membership**

<table>
<thead>
<tr>
<th>Chairperson</th>
<th>Chief Electrical Inspector (non-voting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Electrical Board Members (non-voting)</td>
</tr>
<tr>
<td>1</td>
<td>Training School Representative</td>
</tr>
<tr>
<td>1</td>
<td>Continuing Education Provider</td>
</tr>
<tr>
<td>2</td>
<td>Electrical Apprenticeship Representatives</td>
</tr>
<tr>
<td>1</td>
<td>Electrical Manufacturer Representative</td>
</tr>
<tr>
<td>2</td>
<td>L&amp;I Inspection (Supervisor &amp; Inspector)</td>
</tr>
<tr>
<td>2</td>
<td>City Regulator (Supervisor &amp; Inspector)</td>
</tr>
<tr>
<td>1</td>
<td>Plumber (Contractor or Worker)</td>
</tr>
<tr>
<td>1</td>
<td>WA Manufacturing Business</td>
</tr>
<tr>
<td>1</td>
<td>Electrical Engineer</td>
</tr>
<tr>
<td>1</td>
<td>Electrical Testing Laboratory</td>
</tr>
<tr>
<td>1</td>
<td>Electric Utility Representative</td>
</tr>
<tr>
<td>1</td>
<td>General Public Member</td>
</tr>
<tr>
<td>10</td>
<td>Electricians</td>
</tr>
<tr>
<td>10</td>
<td>Electrical Contractors</td>
</tr>
</tbody>
</table>
Notes:
- Contractor positions must be filled by a member of the firm or assigned administrator/master electrician of a licensed electrical/telecommunications contractor or representative of an electrical contractors’ association in Washington representing that specialty.
- Electrician positions must be filled by a certified electrician who is not a member of the firm or assigned administrator/master electrician in an electrical contracting business.
- The AD HOC contractor and electrician positions must be filled by a specialty not otherwise represented on the TAC.
- 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.

<table>
<thead>
<tr>
<th>Active Licenses &amp; Certificates</th>
<th># of Contractors</th>
<th>% of All Licenses</th>
<th># of TAC Members</th>
<th># of Electricians</th>
<th>% of All Certificates</th>
<th># of TAC Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>2835</td>
<td>56.9%</td>
<td>6</td>
<td>17,858</td>
<td>63.0%</td>
<td>6</td>
</tr>
<tr>
<td>02</td>
<td>322</td>
<td>6.5%</td>
<td>2</td>
<td>2,399</td>
<td>8.5%</td>
<td>1</td>
</tr>
<tr>
<td>03</td>
<td>111</td>
<td>2.2%</td>
<td></td>
<td>314</td>
<td>1.1%</td>
<td></td>
</tr>
<tr>
<td>03A</td>
<td>42</td>
<td>0.8%</td>
<td></td>
<td>106</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>81</td>
<td>1.6%</td>
<td></td>
<td>257</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>547</td>
<td>11.0%</td>
<td>1</td>
<td>3,096</td>
<td>10.9%</td>
<td>1</td>
</tr>
<tr>
<td>06A</td>
<td>512</td>
<td>10.3%</td>
<td>1</td>
<td>2,564</td>
<td>9.1%</td>
<td></td>
</tr>
<tr>
<td>06B</td>
<td>12</td>
<td>0.2%</td>
<td></td>
<td>124</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>88</td>
<td>1.8%</td>
<td></td>
<td>979</td>
<td>3.5%</td>
<td></td>
</tr>
<tr>
<td>07A</td>
<td>13</td>
<td>0.3%</td>
<td></td>
<td>73</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>07B</td>
<td>50</td>
<td>1.0%</td>
<td></td>
<td>217</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>07C</td>
<td>1</td>
<td>0.0%</td>
<td></td>
<td>23</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>07D</td>
<td>41</td>
<td>0.8%</td>
<td></td>
<td>185</td>
<td>0.7%</td>
<td></td>
</tr>
<tr>
<td>07E</td>
<td>6</td>
<td>0.1%</td>
<td></td>
<td>74</td>
<td>0.3%</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>296</td>
<td>5.9%</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>25</td>
<td>0.5%</td>
<td></td>
<td>58</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>Ad Hoc Group</td>
<td>1,088</td>
<td>22.2%</td>
<td>2</td>
<td>7,373</td>
<td>26.0%</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td>4982</td>
<td></td>
<td>10</td>
<td>28,327</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>

Notes: <10% of Licenses/Certificates joins the Ad Hoc group

The Ad Hoc group will be filled on an equitable basis with an emphasis on representation closely following the % of licenses.

Unfilled positions will remain vacant.

● Keep Informed

There will not be a specific mailing list for this WAC revision process. Special WAC update postings will be maintained using the Electrical Program’s Electrical Email List, Rule Development page of our 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: https://public.govdelivery.com/accounts/WADLI/subscriber/new?topic_id=WADLI_40
PROPOSAL FORM for 2020 WAC 296-46B Rule Changes

Email to:  ElectricalWAC@lni.wa.gov
          as an attachment

FOR L&I USE ONLY

Specific Rule #:
Date Received:
Comment:

NOTES:
1. All proposals must be received from 12:00 a.m. October 10 through 11:59 p.m. November 15, 2019.
2. Limit each proposal to a single rule section. Use a separate copy for each proposal.
3. ENTER TEXT ONLY IN THE UN-SHADED SPACES ON THIS DOCUMENT – SAVE AS A NEW FILENAME BEFORE RETURNING

Date submitted: ___________________________ Name: ___________________________
Representing: __________________________________________ Telephone: ___________________________
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)
**Question of the Month** – According to the 2020 National Electrical Code (NEC), how many receptacle outlets are required for the countertop surface of an island measuring 4 feet by 8 feet? *See correct answer on Page 2.*

**Attention Trainees – Beginning July 1, 2020, You Must Complete Classroom Training to Renew your Certificate.**

The recent WAC 296-46B revisions contain an important change regarding renewal of electrical training certificates. We have found the current practice of allowing trainees to renew without completing their classroom training is in violation of the electrical laws – RCW 19.28.161(2), which requires holders of training certificates to renew every two years. At the time of renewal, the law requires trainees to provide proof of approved classroom training covering RCW/WAC, national electrical code, or electrical theory. Rules regarding renewal of training certificates are specified in WAC 296-46B-942(6) – (14). The current practice of allowing trainees to renew without having completed the required classroom training and placing their certificate into inactive status will continue until July 1, 2020, at which time renewal candidates must show proof of classroom training to renew.

Another change to align department rules with the law has to do with submission of affidavits of experience at the time of renewal of a training certificate. We published this change several times beginning in the October 2018 Electrical Currents newsletter. Within one-hundred eighty days after the expiration date of an electrical training certificate, the individual, if not enrolled in a department approved apprenticeship program, must submit a completed, signed, and notarized affidavit(s) of experience for all hours of experience gained since the individual’s last training certificate was effective.

**2020 National Electrical Code (NEC) is published – Effective in Washington July 1, 2020**

The National Fire Protection Association (NFPA) has published the 2020 NEC. Copies are available for purchase on the Buy NFPA 70, National Electrical Code (NEC) page of NFPA’s website. You can also view the 2020 NEC by selecting the free access button on the NFPA 70 page.

Washington has adopted the 2020 NEC with an effective date of July 1, 2020. Installations covered by all permits purchased beginning on that date must comply with the 2020 edition as modified by WAC 296-46B.

We have delayed the effective date until next July to give the department and electrical program stakeholders a chance to review the 2020 NEC. The department may be open to consideration of amendments. Now would be the time to do a thorough review of the 2020 NEC and think about any proposals that you may wish to submit should that happen. Watch future editions of this newsletter for further information about whether additional changes will be considered to WAC 296-46B regarding the 2020 NEC.

**Ground-Fault Protection in Marinas**

WAC 296-46B-555 gives requirements for ground-fault protection in marinas, which modifies the 2017 NEC requirements in Article 555. Beginning September 1, 2019, ground-fault protection for marinas, boatyards, and commercial and noncommercial docking facilities are as published in the 2020 NEC. Article 555 has changed significantly in the 2020 edition. Ground-fault protection requirements are now found in NEC 555.35. Because the 2020 NEC is not effective until July 1, 2020, only the ground-fault protection requirements in 2020 NEC 555.35 will be effective now. Here is a summary of the new requirements:

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: [http://www.ElectricalCurrents.lni.wa.gov](http://www.ElectricalCurrents.lni.wa.gov)

• Receptacles Providing Shore Power. Receptacles shall have individual ground-fault protection of equipment (GFPE) set to open at currents not exceeding 30 milliamperes.
• GFCI Protection for Personnel. All 125-volt, single-phase, 15- and 20-ampere receptacles for other than shore power shall have ground-fault circuit interrupter (GFCI) protection in accordance with NEC 210.8.
• Feeder and Branch-Circuit Conductors with GFPE. Feeder and branch-circuit conductors that are installed on docking facilities shall be provided with GFPE set to open at currents not exceeding 100 milliamperes. Coordination with down-stream GFPE shall be permitted at the feeder overcurrent protective device.

Notice the 2020 NEC 555.35(B) will require a leakage current measurement device to be available for use where more than three receptacles supply shore power to boats. This will allow users to determine when an individual boat has defective wiring or other problems contributing to hazardous voltage and current.

While a properly installed and maintained ground-fault protection system may reduce the likelihood of hazardous stray currents in the water in a marina, swimming in and around a marina where electricity is present should never be permitted.

Assisting a Householder with Electrical Wiring

Generally, electrical wiring must be performed by persons that are qualified to make safe installations and businesses that are licensed and bonded. The law provides for some exceptions, which allows property owners and their employees to perform work on property they own. Another exemption allows anyone to assist a “householder” with wiring on a single-family residence provided the householder is present while the person is assisting them and the person assisting does not receive money or other forms of compensation for their assistance. This exemption is found in WAC 296-46B-925(14) and is based on RCW 19.28.261(6). Often, this exemption is abused when a person who is being paid by the property owner performs electrical wiring and claims they are “assisting” the owner using the owner’s electrical permit. A person or company may be on-site performing a related construction project for which they are being paid and, in addition, they choose to or are asked by the customer to perform electrical wiring for the customer. It is not likely in this scenario that they are assisting the householder. They are being paid to perform the entire project. Anyone performing electrical wiring on a project where they are being paid is in the business of performing electrical installations. In this case, they must be a certified electrician working for a licensed electrical contractor under that electrical contractor’s permit.

Normal Electrical Inspection of Equipment and Machinery

RCW 19.28.010(1) requires all materials, devices, appliances, and equipment used in electrical installations to be of a type that conforms to applicable standards or be indicated as acceptable by the established standards of any electrical product testing laboratory which is accredited by the department. The National Electrical Code is the primary standard used by electrical inspectors to evaluate installation of electrical materials and devices. It is generally not applicable to evaluate electrical appliances or equipment due to the various methods and materials used.

There is a provision in WAC 296-46B-903(5)-(6) that allows normal department inspection for industrial control panels and utilization equipment. Successful “normal department 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. The electrical system of unlisted equipment is usually not constructed to the NEC and must be field evaluated by an approved testing laboratory or, for industrial control panels and industrial utilization equipment only, engineering evaluated.

When an electrical contractor connects a piece of unlisted equipment so it can be energized, the contractor’s actions create a potential safety hazard. Until the equipment is proven safe through field or engineering evaluation, the contractor shares responsibility with the equipment owner to correct the potential hazard.

Ugly Picture of the Month: If viewing this document online, click on the picture to open a larger image. Yes, those are plumbing “Y” fittings, and no, this is not acceptable. Creative though!

Answer to Question of the Month: Two. 2020 NEC 210.52(C)(2) – At least one receptacle outlet shall be provided for the first 9 ft², or fraction thereof, of the countertop or work surface. A receptacle outlet shall be provided for every additional 18 ft², or fraction thereof, of the countertop or work surface.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
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 & Industries is an Equal Opportunity employer.
SPECIAL EDITION

Significant Changes – 2019 WAC 296-46B

In this issue, we will review some of the significant changes in the 2019 WAC 296-46B electrical rules. The changes will be effective August 23, 2019. Installations made using electrical permits purchased on or after that date must comply with the revised requirements. We are also adopting the 2020 National Electrical Code (NEC) but it will not become effective until July 1, 2020. None of the current exam questions are affected by these changes.

This document does not cover all changes. We wrote it to help you become aware of some of the more important changes. A complete version of the 2019 WAC 296-46B will soon be available at:


- WAC 296-46B-010(1) – Adopted standards – 2020 National Electrical Code (NEC)
  We are adopting the 2020 NEC with an effective date of July 1, 2020. The 2020 NEC will apply to installations for all permits purchased on or after that date. We will consider rule proposals after publication of the 2020 NEC in September.

- WAC 296-46B-100 – General definitions
  o “New building” – For the purposes of RCW 19.28.261, includes the setting of a manufactured, mobile, or modular building. This clarifies that property owners or leaseholders cannot install wiring for a mobile or manufactured home then offer it for sale or lease without electrical contractor license and worker certification. We made the same change to WAC 296-46B-925(13).
  o We removed four definitions specific to electrical services because the NEC definitions now accomplish what the rule did.

- WAC 296-46B-210(3) – Other than dwelling units – GFCI requirements
  A new rule clarifies that receptacles used for recreational vehicle supply equipment or for attachment of a mobile home supply cord do not require GFCI protection. It does not apply to 125-volt, single phase, 15- or 20-amp receptacles.

- WAC 296-46B-215(1) – Feeders – Minimum rating and size
  This new rule for feeders is similar to one already required for services. If the feeder conductors have a lesser ampacity than the rating of the equipment they terminate in or on, you must install an identification plate that states the ampacity of feeder conductors. It does not apply to one- or two-family dwelling feeders rated up to 400 amperes.

- WAC 296-46B-225 – Outside branch circuits and feeders – Clearances from roofs
  This rule adds an exception to NEC 225.19(A). It allows a reduction in clearance to 3 feet where feeder conductors that do not exceed 300 volts pass over a guarded or isolated roof. NEC 230.24(A) contains this exception for overhead service conductors and this rule now applies to feeder conductors as well. This change allows us to eliminate WAC 296-46B-230(4)(c) regarding residential patio covers.
• **WAC 296-46B-408 – Switchboards, switchgear, and panelboards**
  We moved this rule from WAC 296-46B-230(10). It prohibits installation of service equipment, subpanels, and similar electrical equipment in clothes closets, toilet rooms, and shower rooms. We moved it here because the rule also applies to panels for other than services.

• **WAC 296-46B-410(3) – Luminaires – Protection of conductors and insulation**
  This new rule clarifies that requirements of NEC 410.56(E) for stranded conductors do not apply to branch-circuit conductors.

• **WAC 296-46B-430 – Marking on motors**
  We amended this rule that requires motors to comply with National Electrical Manufacturer’s Association (NEMA) standards. Now it allows approval of motors built according to International Electrotechnical Commission (IEC) standards.

• **WAC 296-46B-440 – Air conditioning and refrigerating equipment – Split system indoor disconnecting means**
  We amended this rule, which does not require a disconnecting means for the indoor unit of a split system in one- and two-family dwelling units under certain conditions. The change requires the outdoor unit to have a label identifying the location of all indoor units. This is an existing department policy published in the November 2013 Electrical Currents newsletter.

• **WAC 296-46B-501(8) – Sewage disposal systems**
  This new rule coordinates with Department of Health rules. It requires on-site sewage disposal systems using pumps to have audible and visual alarms designed to alert the resident of a malfunction. A circuit independent of the pump circuit must supply the alarm.

• **WAC 296-46B-514(7) – Motor fuel dispensing facilities – Maintenance disconnecting means**
  This new rule clarifies the NEC 514.3 requirement for a maintenance and service disconnect for fuel dispensing equipment. It must be capable of isolating each dispenser individually from all external voltage sources including the grounded conductor, while all other dispensers remain operational.

• **WAC 296-46B-555 – Marinas – Ground-Fault protection**
  Beginning September 1, 2019, ground-fault protection for marinas will be as published in the 2020 NEC. This provision was effective July 1, 2018.

• **WAC 296-46B-620 – Elevators – Disconnecting means**
  This new rule coordinates L&I electrical and elevator program requirements. It specifies the location of elevator disconnects in elevator machine rooms.

• **WAC 296-46B-705(2) – Interconnected electric power production sources – Supply side disconnect**
  We amended this rule to clarify the wiring methods, grounding, and bonding requirements for a supply side interconnection disconnect. It requires the same rules as if it were an additional service.

• **WAC 296-46B-908(10)(b)(iii) – Class B scope of work – Like-in-kind furnace replacement**
  We amended the Class B random inspection process scope for low voltage HVAC control wiring. The change allows low voltage wiring for an existing and/or new thermostat, heat pump, or air conditioner using the same Class B label as the replacement of a furnace.

• **WAC 296-46B-915 – Civil penalty schedule**
  We increased the penalty for unlicensed electrical contracting to $1000 for a first offense with a maximum penalty of $10,000. The penalties have not increased for over thirty years. The Technical Advisory Committee and the Electrical Board overwhelmingly supported this provision.
• **WAC 296-46B-920(2)(f)(iv)(A) – Scope of work – HVAC/refrigeration systems specialty**
  We amended the HVAC/R specialty scope of work to allow, if HVAC/R equipment is being replaced, the specialty may remove and replace a disconnecting means enclosure mounted on the surface of the HVAC/R equipment with a like-in-kind disconnecting means enclosure rated not more than 20 amperes and 120 volts using the existing wiring method.

• **WAC 296-46B-940(3) – Electrician certificate of competency required**
  We amended this rule to consider a supervising electrician to be working in the electrical construction trade while supervising trainees (even if the supervising electrician is not performing electrical work). This requires the supervising electrician to display an electrician’s certificate appropriate for the work performed by the trainee(s).

• **WAC 296-46B-940(17)-(19) – Reciprocal agreements between Washington and other states**
  This new rule specifies requirements for the department to enter into reciprocal agreements for electrician certification with other states as allowed by [RCW 19.28.231](http://www.Lni.wa.gov).

• **WAC 296-46B-942(1) – Training certificates**
  This new rule alerts everyone that beginning July 1, 2023, unless working in a specialty, apprentices and individuals learning the electrical construction trade must have in their possession proof of being registered in an approved journey level electrical apprenticeship or journey level electrical training school program.

• **WAC 296-46B-942(8)(d) – Renewal of training certificates – Timely submittal of affidavits of experience**
  We amended the rules for renewal of training certificates to require trainees to submit affidavits of experience for all hours gained since the individual’s last training certificate was effective within one-hundred eighty days after the expiration date of an electrical training certificate unless enrolled in a department approved apprenticeship program. This is in accordance with [RCW 19.28.161](http://www.Lni.wa.gov).

• **WAC 296-46B-942(9) – Renewal of training certificates – Basic classroom training required to renew**
  Effective July 1, 2020, an individual may not renew a training certificate until they complete the required hours of basic trainee classroom education. The current rule allowing a trainee to pay the renewal fee without completing their required classroom training violated RCW 19.28.161(2) which has no provision for inactive status for a trainee who has not completed the required basic classroom training.

• **WAC 296-46B-945(4) – Qualifying for the journey level electrician examination – Apprenticeship required**
  This new rule alerts everyone of the coming July 1, 2023 requirement for completion of apprenticeship to qualify for the journey level electrician certificate of competency examination.

• **WAC 296-46B-945(14) – Canadian Red Seal electricians**
  This new rule allows Canadian Red Seal electricians to qualify for the journey level certificate of competency examination if they have possessed a Red Seal endorsement for one year.

• **WAC 296-46B-990(3) – Serious noncompliance**
  We amended the rule defining serious noncompliance, which allows suspension or revocation of an electrical license or certificate to include:
  - Using or allowing a certificate to be used through error or fraud.
  - Refusing to present a government issued photo identification when requested by an electrical inspector while working as an electrician or trainee.
  - Cheating on an electrical certification examination.

• **WAC 296-46B-995(14) – Electrical board appeal rights and hearings**
  This new rule specifies requirements for appealing a decision pursuant to [RCW 19.28.010(4)](http://www.Lni.wa.gov) issued through an appellate process of a city or town to the Electrical Board.
Question of the Month – How many vacant positions are there in the L&I electrical program? See correct answer on Page 2.

Electrical Program Specialists and Customer Service Specialists Are Here to Help You

Do you need help with an electrical permit, requesting an inspection, electrical contractor license, electrician or training certificate? Our dedicated team of customer service specialists and electrical program specialists are here to help you.

Electrical Program Specialists report to the electrical inspection supervisors and are a point of contact for all electrical customers. They are accessible throughout the day and are here to help you with more complex electrical program issues. They perform tasks previously handled by inspectors, leads, and supervisors. This allows the inspectors to spend more time performing inspections and supervisors to have more time supervising inspectors. If you receive a survey, please let us know how we are doing.

Customer Service Specialists staff the front counters of every L&I service location. They have the monumental task of helping L&I customers with the wide range of L&I services available to employers and workers. They help customers with a vast array of L&I programs including workplace safety, industrial insurance, filing injury claims, employer services, contractor registration, electrical permits, licensing and certification for electrical contractors, electricians, and plumbers.

If you have a question or need help with any of our services, you can call your nearest service location and, depending on your question, a customer service specialist or electrical program specialist will help you.

Emergency Rule – Temporary Electrician Permits and Reciprocal Agreements

L&I has filed an emergency rule to issue temporary electrician permits in lieu of certificates of competency for electricians coming to work in Washington from another state. It also establishes rules for reciprocal agreements with other states for electrician certification. No reciprocal agreements are in place at this time.

The emergency rule — WAC 296-46B-939 — was adopted July 3 and is in effect for 120 days, ending on October 31, 2019. The agency is responding to our customers' need for electricians as allowed by RCW 19.28.231 while trying not to diminish the safety of electrical installations.

For more information or to apply, contact L&I's Electrical Program at 360-902-5249 or ElectricalProgram@Lni.wa.gov.

Here is What We Accomplished in Fiscal Year 2019

Increased demand for permits, inspections, plan review, and licensing reflect Washington’s healthy construction economy. Here is what happened in FY19 (July 1, 2018 through June 30, 2019), which demonstrates the amount of work performed by our dedicated staff:

- 161,390 electrical permits were sold, an increase of 9.4% over last year. 94% were purchased online.
- 260,302 electrical inspections were made. 84% were requested online. We are in the pilot stage of a virtual electrical inspection program. 1,200 inspections were made using this process. It allows electrical contractors to obtain an inspection while they are on the jobsite by scheduling a virtual inspection on short notice using their smart phone.
- We drove over 2.3 million miles with only 10 at-fault accidents, mostly minor fender-benders.
• Electrical inspection reporting improvements now provide near real-time inspection results. Most customers receive an email message with their inspection results immediately after the inspection.

• Inspectors issued 44,422 corrections for serious code violations. These represent about half of total corrections and are violations that could result in disconnection of power if not corrected. By far, property owner permits are most likely to receive serious corrections. Inspectors issued at least one serious correction for 50% of property owner inspections, compared to 15% for electrical contractor inspections.

• Our inspection response times have improved. For FY19, we responded to approximately 84% of inspections within 24 hours of the date requested and 94% within 48 hours. While this is an improvement over last year, this means that 14,737 times, customers had to wait more than 48 hours for inspection. The number of inspectors, workload, and inspections in remote areas of the state affect response times. Filling vacant positions and getting new inspectors trained and working efficiently will be key to improving our response times.

• Speaking of training, since our formal inspector training program was established in 2013, 123 have completed basic inspector training. Almost half of our 128 inspectors and leads have less than 5 years’ experience with the department. All new inspectors must complete a two-year training program.

• Our team of dedicated plans examiners reviewed over 6,400 pages of drawings for educational, institutional, or health care facilities. We review plans to ensure the design for these facilities meets the minimum requirements for electrical safety. The average backlog for a set of plans awaiting review in FY19 was 1.8 weeks. We reviewed almost 2200 pages using our new electronic plan review process saving customers and the department from having to print, handle, and ship paper plans for those projects.

• Typically, 20% of contractors receive 80% of corrections. The correction reduction initiative helped contractors identified as having the most corrections per inspection the prior fiscal year realize a 26% decrease in the number of corrections they received. Each month, contractors in this group get a list of their corrections and are encouraged to use the information to help their electricians make safer installations.

• 6,050 citations were issued for the focused underground economy violations of the electrical laws. These violations include failing to obtain electrical permits, unlicensed electrical contractors, uncertified electricians, and failing to properly supervise trainees. This is an increase from the previous year’s 5,066 citations. It is mostly due to the E-CORE team finding many non-compliant jobs involving out-of-state unlicensed contractors and electricians performing work at large retail chains. Many of these jobs were taken over and completed by licensed electrical contractors.

• The licensing section processed 29,354 licenses (contractor, electrician, and trainee applications, and renewals). Almost 96% of these were processed the same day they were received.

• Customers submitted over 16.5 million hours of work experience for review to our licensing department to qualify for electrical certification exams. Of those, 3,932,305 electrical trainee and out-of-state electrician hours were flagged for review by our auditors, and of those, 1,137,872 were denied. Reasons for denial include inability to verify out-of-state experience, no active training certificates, lack of proper supervision (sometimes no certified electricians on staff), not able to verify employment (no legal employment records), no electrical permits to verify work performed, and lack of valid contractor licensing.

Ugly Picture of the Month: If viewing this document online, click on the picture to open a larger image. Be careful what you order online! The wife of one of our Technical Specialists ordered two luminaires online after receiving advice to make sure they were listed by an accredited testing laboratory. The picture shows the installation instructions that came with the luminaires. No listing mark could be found on them. Following the installation instructions would create a hazard and violation of NEC 300.15. Needless to say, the luminaires are on their way back to China.

Answer to Question of the Month: There are currently eighteen vacant positions in the electrical program. See last month’s newsletter article if you would like to become an electrical inspector.
Question of the Month

Is the electrical equipment associated with a hydromassage bathtub permitted to be accessible only from the crawlspace beneath the tub? *See correct answer on Page 2.*

Electrical Inspector Positions Available

Do you enjoy a challenge? Have you ever thought about becoming an Electrical Inspector for L&I? Do you have 4 years’ experience as a Washington EL01 certified electrician? The time may be right if you enjoy serving customers and interacting with electrical contractors, electricians, and the public. If you want to help ensure electrical safety in Washington and help licensed electrical contractors and certified electricians by enforcing laws related to the underground economy, this could be just what you are looking for. It is a great job with a great benefit package. Inspectors have a challenging workload inspecting a wide variety of interesting and complex electrical installations.

You can get more information and apply for these positions by visiting the Find a Job at L&I page of our website. Clear the search box, type “electrical inspector”, and hit enter. You may see several postings. Some are for specific locations, or you can choose one for “multiple opportunities available”. Read the posting and click “Apply”. You will need to create a user name and password to access the electronic application system. Get your resume together and keep watching, as openings will be posted for upcoming positions. Check with your local inspector or supervisor for information about upcoming openings.

Public Hearing – WAC 296-46B Revisions

L&I held a public hearing on the proposed changes to the electrical rules in WAC 296-46B on June 5 in Tumwater. The purpose of the hearing was to receive public comment on the proposed changes. One person gave public testimony. The comments were in support of the changes. You can review the proposed rules and other rulemaking documents by visiting the Rule Development page of our website. The proposed rules are scheduled to be effective August 23.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Electrical Board Meeting July 25 in Tumwater

The electrical board meets four times per year on the last Thursday of January, April, July, and October. The meetings are open to the public and meeting times and locations as well as minutes of previous meetings are posted on the Electrical Board page of our website. This month’s meeting will be held July 25 at 9 a.m. at the Tumwater L&I building auditorium, 7273 Linderson Way SW, Tumwater.

Correction Reduction Initiative

At the beginning of each fiscal year (in July), the department identifies contractors who received more than twice the average number of corrections for contractors with at least 24 inspections in the previous year. Then, each month these contractors receive a list of all their corrections from the previous month. This gives them an opportunity to review the items with their electricians to improve the quality of their work.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.Lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
This initiative has proven to be very successful in helping contractors reduce corrections and save money for themselves and the department. During fiscal year 2019, (July 1, 2018 through June 30, 2019), the contractors in the correction reduction initiative reduced their corrections by an average of 25 percent from the previous year. The result is safer electrical installations at a significant cost savings to the contractor, customers, and the department. Corrections cost everyone by causing return visits to the jobsite. Our studies have shown that 20 percent of contractors receive 80 percent of corrections.

We use this initiative to improve our own performance as inspectors as well. Contractors who believe they have received improper corrections should contact the electrical inspection field supervisor for the issuing office to discuss possible invalid corrections, such as those that are not within the scope of the contractor’s work, or those that are not supported by a correct code reference. A contractor should never accept invalid corrections because they fear reprisal from an inspector or supervisor. Our inspectors are required to provide an accurate reference (NEC, WAC) for all corrections issued. Improper corrections will be remove from the contractor’s record.

**Top Ten Electrical Installation Code Corrections Issued to Electrical Contractors**

Corrections issued to licensed electrical contractors are very costly. Below are the top ten installation code corrections issued to electrical contractors last year.

1. NEC 110.3(B) Listed and labeled electrical equipment not installed in accordance with the manufacturer’s installation instructions included in the listing and labeling.
2. NEC 210.8(A) and (B) Ground-fault circuit-interrupter protection requirements.
3. NEC 408.4(A) and 110.22(A) Failing to ensure accurate labeling of the panel schedule, circuit directory, or disconnecting means.
4. NEC 210.12(A) and (D) Arc-fault circuit-interrupter protection requirements for dwellings.
5. NEC 250.104(B) Bonding of metal piping systems including gas piping.
6. NEC 250.94 Intersystem bonding termination required for communications systems bonding.
7. NEC 110.7 Wiring integrity – completed wiring installations shall be free from short circuits, ground-faults, or any unpermitted connections to ground.
8. NEC 110.24(A) Service equipment at other than dwelling units to be marked in the field with the maximum available fault current.
9. NEC 250.24(A) System grounding connection requirements for services.
10. NEC 314.25 Each box shall have a cover, faceplate, lampholder, or luminaire canopy.

**Contractors – Be Sure Customers Know Inspections Need to Happen**

We are finding customers are not aware that electrical work requires inspections. Too often, we hear customers who claim, “My electrical contractor never told me I needed an inspection”. Some are reluctant to allow access to an inspector. Inform your customers an inspection is required and what to expect. Better communication improves response time and reduces delays. Inspections are about safety and everybody needs to work together to get them done. Ultimately, it is the contractor’s responsibility to make sure inspectors get access and have clear directions about what needs inspection.
Ugly Picture of the Month: If viewing this document online, click on the picture to open a larger image.

This house was wired in 1998. Two nonmetallic-sheathed cables and a siding nail were occupying the same hole. It became an issue 20 years later when smoke started coming into the garage. **WAC 296-46B-010(6)** was adopted to help prevent this from happening in the future.

**Answer to Question of the Month:** No. **WAC 296-46B-680(12)** – For hydromassage bathtubs, all electrical equipment installed to support the bathtub (e.g., disconnecting means, motor, etc.) must be accessible at the same grade level as the tub or from a landing on the exterior of the building without the use of a ladder or other access device.
Question of the Month – After validated online, how long is a Class B label good for? See correct answer on Page 2.

Public Hearing – WAC 296-46B Revisions

L&I will hold a public hearing on the proposed changes to the electrical rules in WAC 296-46B. The purpose of the hearing is to receive public comment on the proposed changes. You can review the proposed rules and other rulemaking documents (including how to submit written comments) by visiting the Rule Development page of our website. Anyone can give the department comments on the proposed rules. Hearing details:

- **Date:** June 5, 2019
- **Time:** 9:00 a.m.
- **Location:** Department of Labor & Industries
  7273 Linderson Way SW, Room S119
  Tumwater, WA 98501

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

You Can Comment Now on Several Proposed Changes to the 2017 and 2020 NEC

The National Fire Protection Association (NFPA) is considering changes to the National Electrical Code (NEC) through nine Tentative Interim Amendments (TIAs). You can review and comment on these proposals by visiting the NFPA 70 page of their website. The comment period for these proposals closes June 27, 2019. Some of the changes being considered are:

- Limiting the use of nonmetallic-sheathed cable in NEC 334.10 to four stories in multi-family dwellings and other structures of Types III, IV, or V construction. This proposal is due to changes to the International Building Code allowing new categories of type IV buildings (mass timber) to include buildings up to eighteen stories.
- Changing the measurement method for GFCI requirements in NEC 210.8, which would require GFCI protection for receptacles within six feet of a sink even if located behind a cabinet door, such as a receptacle for a garbage disposal in the cabinet under the sink.
- Adding wording to require performance testing of arc energy reduction protection systems in NEC 240.67(C) and 240.87(C) using primary current injection testing or another approved method.
- Restore language in NEC 210.52(C)(2) of the 2020 edition stating a peninsular countertop is measured from the connected perpendicular wall.

Electric Vehicle (EV) Power Charging Equipment with Adjustable Load Ratings

Installers and inspectors have asked how to determine the rating of the service, feeder, or branch circuit supplying EV charging equipment with adjustable current rating settings. A change proposed in the 2020 NEC will help to clarify this question. The language in the proposed 2020 NEC 625.42 permits adjustable settings on fixed-in-place equipment only. Adjustments must be in accordance with the manufacturer’s instructions. Electric vehicle supply equipment with restricted access to an ampere adjusting means will be permitted to have ampere ratings that are equal to the adjusted current setting. Sizing the service and feeder to match the adjusted amperage will be permitted. Restricted access can be accomplished by a cover or door that requires the use of a tool to open, locked doors accessible only to qualified personnel or password protected commissioning software accessible only to qualified personnel.
The department will allow adjustable charging equipment to comply with the above requirements until the 2020 NEC is effective. At that time, requirements will be as published in the 2020 NEC.

Hazardous Conditions at the Inspection Site

Electrical inspectors are required to follow the same workplace safety rules as everyone else. Sometimes, a jobsite contains health or safety hazards that are not obvious. The presence of asbestos, dangerous chemicals, structural damage to the building, fall protection hazards, or even loose pets may catch an inspector unaware and have the potential to delay your inspection. Please help us by making the inspector aware of any potential hazards on your jobsite. You can do this by clearly identifying the hazard(s) at the jobsite, providing a comment about the hazard(s) in the inspection request, or notifying the inspector directly of the hazard(s) before the inspection.

How to Avoid Employing Expired or Inactive Certificate Holders

It is unlawful to employ someone to perform electrical work with an expired or inactive certificate. Often, forgetting or waiting to renew because they have not completed continuing education or basic classroom training is the cause. Checking expiration dates of the certificates your electricians display on their person is one way to keep track of things. Another way is to use the Verify a Contractor, Tradesperson or Business page of our website. You may want to consider using a calendaring program to set a reminder 90 days prior to everybody’s expiration date to alert you when certificates are eligible to be renewed.

Renewal reminders go out 90 days before certificates expire. Applicants can renew at that time if they have fulfilled their educational requirements. If someone is looking for an approved class to fulfill their education requirements, refer them to the Electrical Workers’ Educational Requirements page of our website.

Don’t be an Absentee Administrator

“Absentee Administrator” is a term used to describe a person who chooses to assign themselves as the administrator or master electrician for an electrical contractor, but is not actually involved in the day-to-day electrical activities of the company. The electrical laws and rules deal with this kind of violation very seriously. In addition to monetary penalties for contractors who employ absentee administrators, penalties begin at $1,000 for absentee administrators or master electricians.

RCW 19.28.061 states that the person designated as the master electrician or administrator for an electrical contractor must be a member of the firm or a full-time supervisory employee. He/she must be available during working hours to carry out the duties of an administrator. For further clarification of the terms “member of the firm” and “full time supervisory employee” see WAC 296-46B-930.

The contractor must name all members of the firm on the electrical contractor’s license. Partners must be on file with the department of licensing and corporate officers or members of an LLC or INC must be on file with the Secretary of State.

When determining the full-time supervisory employment status of the assigned person, the department will consider whether the individual is on the contractor’s full-time payroll; receives a regular salary or wage similar to other supervisory employees; has supervisory responsibility for work performed by the contractor; is available during normal business hours, and carries out the duties shown in RCW 19.28.

Ugly Picture of the Month: If viewing this document online, click on the picture to open a larger image. Human creativity is pretty amazing. When faced with the problem of a wire too small for the provided lug, here is one property owner’s noncompliant solution.

Answer to Question of the Month: All Class B work must be completed within fifteen days after the label is validated. If the work is not completed within that time, another Class B may be posted. Except that, in a one-or two-family residential structure, a label is valid for ninety days after the label is validated, so long as all work described on the label is performed by the purchaser.
Question of the Month – When will the 2020 National Electrical Code (NEC) be published, and when will it be effective in Washington? See correct answer on Page 2.

Invitation to a Stakeholder Meeting Near You

Five meetings in May will complete 19 electrical stakeholder meetings in various locations across the state between January and May 2019. Meetings are an opportunity to talk with the Electrical Program staff in an informal setting. Attend a meeting near you, we want to hear how we can better serve you and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. If you are not on the email list to receive these newsletters, you may join at our Electrical Email List webpage.

<table>
<thead>
<tr>
<th>2019 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 14 – Spokane – <strong>Spokane Falls Community College</strong>, 3410 W. Fort George Wright Dr, Bldg 17, Sub Lounges</td>
</tr>
<tr>
<td>May 15 – Colville – <strong>Spokane Community College</strong>, 985 S Elm St., Combined Room</td>
</tr>
<tr>
<td>May 16 – Pullman – City Parks &amp; Rec, Barley Rm. – 240 SE Dexter St.</td>
</tr>
<tr>
<td>May 21 – Kennewick – <strong>Benton PUD Auditorium</strong> – 2721 West 10th Avenue</td>
</tr>
<tr>
<td>May 22 – Moses Lake – <strong>L&amp;I Building</strong> 3001 West Broadway Avenue</td>
</tr>
</tbody>
</table>

Rule Update – WAC 296-46B Revisions

A Second Draft of the proposed rules is posted on the Rule Development page of our website.

A public comment period will open soon so that anyone may submit written comments. In addition, a public hearing will be held at the Tumwater L&I building, exact date and time to be announced. Watch for updates on the Rule Development page and in next month’s newsletter.

For more details about the process, or to view or download rulemaking documents including the Second Draft, visit the August 2018 Special Edition Electrical Currents newsletter.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Electronic Plan Review Process Reduces Waste of Handling Paper Prints

For some time now, the department has been working on a project that will significantly reduce waste associated with printing, handling, mailing, and processing of paper plans (blueprints) for construction projects that require plan review. While the fully functioning system for processing plans electronically is not complete, the department began accepting electronic plans from customers on a limited basis last year to pilot the new process. This process allows customers, primarily engineering firms who design building projects using computers to send plans to the department for review electronically eliminating the need to print, package, and mail the paper plans to the department. The department receives the electronic plan sets and plans examiners review them on large screen monitors. Electronic stamps and
notes are applied to the pages of approved plans, which are then returned to the customer electronically. Since we began accepting electronic plans, use of this process has grown quickly. For the first three months of 2019, the department received, reviewed, and processed 716 pages of plans using the electronic process. This represents about 37% of total plan pages reviewed during this period. More features will be added when the system is fully functional. So far, reaction from our customers and the plans examiners has been very positive. We want to thank those customers who have helped us pilot and implement the electronic process. This will allow the department to review plans much more efficiently making it easier for stakeholders to do business with the electrical program.

**Electric Vehicle Chargers – GFCI Protection Requirements**

Since 2009, with the passage of House Bill 1481 electric vehicle (EV) infrastructure has become more available. More EVs are on the road as well. This session, the legislature delivered House Bill 1257 to Governor Inslee for signature. This bill requires electric vehicle capability at all new buildings that provide on-site parking.

To minimize shock hazard to users of charging equipment, Article 625 of the 2017 National Electrical Code (NEC) was modified by Tentative Interim Amendment (TIA). Modifications include a new section requiring Ground-Fault Circuit-Interrupter (GFCI) protection for single-phase EV charger receptacles rated 150 volts to ground or less, and 50 amperes or less. In addition to requiring GFCI protection for EV receptacles, TIA 17-2 amends NEC 625.44(A) permitting the use of 240V receptacle outlets for EV charging circuits.

See the complete text of the TIA at: [https://www.nfpa.org/assets/files/AboutTheCodes/70/TIA_70_17_2.pdf](https://www.nfpa.org/assets/files/AboutTheCodes/70/TIA_70_17_2.pdf).

To see all the TIAs and errata, visit the [Current and Prior Editions](https://www.nfpa.org/standards-library/70) tab of the NFPA 70 (NEC®) webpage. Always make sure your published version is up to date by checking for errata and TIAs.

**Exceptions Offered for Untimely Affidavits of Experience**

We have seen too many affidavits of experience denied because they were turned in later than allowed. We have heard you; we understand the impacts. We are improving our communication about requirements and offering a one-time exception as follows:

- Affidavits for legally obtained hours worked on or after June 30, 2014 are eligible for consideration if received before July 1, 2019. Hours worked before June 30, 2014, are not eligible.
  
  This exception applies to all affidavits received through June 30, 2019. We are reviewing untimely affidavits and crediting hours accordingly.

- Beginning July 1, 2019, trainees must turn in affidavits of experience for the prior 2 years within 180 days from the date when their certificate expires. Untimely affidavits will be denied.

The requirements above do not apply to hours worked while a registered apprentice in a recognized electrical construction trade apprenticeship program.

Recently, we sent a letter to all active trainees and electrical contractors about the exceptions offered for untimely affidavits of experience. If you are one of those, and did not receive a letter, please update your address at: [https://www.lni.wa.gov/TradesLicensing/LicensingReg/Legal.asp](https://www.lni.wa.gov/TradesLicensing/LicensingReg/Legal.asp)

For questions about this opportunity, please email us at ElectricalProgram@lni.wa.gov, or give us a call 360-902-5269.

**Ugly Picture of the Month:** If viewing this document online, click on the picture to open a larger image. Green Power? Not exactly your garden-variety electrical panel. 😊

**Answer to Question of the Month:** The 2020 NEC is scheduled to be published August 5, 2019 (a little over three months away)! It will be adopted in Washington with an effective date of July 1, 2020. To learn more about the NEC revision process, visit the [National Electrical Code](https://www.nfpa.org/standards) page of NFPA’s website.
**Question of the Month** — What is the percentage of journey-level exam candidates that pass on the first attempt? *See correct answer on Page 2.*

**Invitation to a Stakeholder Meeting Near You**

There are 19 electrical stakeholder meetings in various locations across the state between January and May 2019. Meetings are an opportunity to talk with the Chief Electrical Inspector in an informal setting. Attend a meeting near you, we want to hear how we can better serve you and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. Meeting dates and addresses are posted on our [Electrical Calendar](http://www.ElectricalProgram.Lni.wa.gov/) webpage. If you are not on the email list to receive these newsletters, you may join at our [Electrical Email List](http://www.ElectricalProgram.Lni.wa.gov/) webpage.

<table>
<thead>
<tr>
<th>2019 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 10 – Everett – Snohomish County PUD – 2320 California St, Commission Rm</td>
</tr>
<tr>
<td>April 11 – Mount Vernon – NW WA Research and Ext Center, 16650 SR 536</td>
</tr>
<tr>
<td>April 23 – Okanogan – Okanogan PUD Auditorium, 1331 2nd Ave N.</td>
</tr>
<tr>
<td>April 24 – Leavenworth – Chelan County PUD Auditorium, 222 Chumstick Hwy.</td>
</tr>
<tr>
<td>April 25 – Yakima – Pacific Power Auditorium, 500 Keys Road</td>
</tr>
<tr>
<td>May 14 – Spokane – Spokane Falls Community College, 3410 W. Fort George Wright Dr, Bldg 17, Sub Lounges</td>
</tr>
<tr>
<td>May 15 – Colville – Spokane Community College, 985 S Elm St., Combined Room</td>
</tr>
<tr>
<td>May 16 – Pullman – City Parks &amp; Rec, barley Rm. – 240 SE Dexter St.</td>
</tr>
<tr>
<td>May 21 – Kennewick – Benton PUD Auditorium – 2721 West 10th Avenue</td>
</tr>
<tr>
<td>May 22 – Moses Lake – L&amp;I Building 3001 West Broadway Avenue</td>
</tr>
</tbody>
</table>

**Big Changes Coming for Trainees and Contractors – Apprenticeship Legislation Passed**

*Substitute Senate Bill 6126* passed by the legislature in 2018 effects those training to become 01 general journey level electricians and those who employ them.

- Effective July 1, 2023, to be eligible for the (01) general journey level electrician examination, applicants must have completed a recognized (01) electrical apprenticeship program approved by the Washington State Apprenticeship Training Council (WSATC) or out-of-state equivalent. This requirement does not apply to those approved for an (01) examination before July 1, 2023 or to any applicants for specialty electrician examinations.

- After June 30, 2023, unless working in a specialty, trainees must be registered apprentices. Apprenticeship programs may credit properly documented electrical experience on record with the department such as, 4000-hour electrical specialty certification, military experience or completion of a two-year training school program. Students enrolled in a two-year program in the electrical construction trade are not required to be registered apprentices while gaining on-the-job training experience during an externship.

**Apprenticeship Roles**

*Electrical Apprentices*—electrical trainees registered in approved Washington State Apprenticeship and Training Council (WSATC) programs or equivalent out-of-state apprenticeship programs. Experience is gained while employed by a training agent.

**Safety Tip of the Month**

Keep an eye out for the safety of your trainees and apprentices. Do not assume a person who is learning the electrical construction trade is familiar with basic electrical safety rules. Trainees and apprentices are eager to please their employers, and it is the electrical contractor’s, administrator’s, and supervising electrician’s responsibility to ensure they do not put themselves or others in danger.
Training Agents—employers who are registered training agents for one or more apprenticeship programs. They abide by apprenticeship standards while providing on-the-job training to apprentices.

More about apprenticeship terms at https://www.lni.wa.gov/TradesLicensing/Apprenticeship/About/glossary/default.asp

Recognized (01) General Journey Level Electrician Apprenticeship Programs

- Construction Industry Training Council of Washington (CITC)
- Area 1 Inside Electrical JATC
- Puget Sound Electrical Joint Apprenticeship and Training Committee
- IBEW 48 NECA-IBEW Electrical JATC
- Inland Empire Electrical Training Trust
- Southwest Washington Electrical Joint Apprenticeship and Training Committee
- LU 112 - NECA Electrical Apprenticeship Committee
- Northwest Washington Electrical Industry Joint Apprenticeship and Training Committee

Want to Sponsor An Apprenticeship Program?

All sponsors for (01) general journey level electrician apprenticeship programs must adhere to Minimum Guideline Standards previously approved by the WSA TC. To download a copy of the Inside Electrician (01) Minimum Guideline Standards Template follow this link.

Registered apprenticeship programs start with the formation of an apprenticeship committee made up of industry members—both employers and employees.

For more information, contact a Labor & Industries Apprenticeship Consultant. Apprenticeship consultants are located all across the state. They will help you identify which type of apprenticeship model best suits your company and then provide one-on-one consulting and on-site assistance to get your program up and running. Contact information for Apprenticeship Consultants can be found at the L&I Apprenticeship Consultants page of our website.

Rule Update – WAC 296-46B Revisions

A Second Draft of the proposed rules is posted on the Rule Development page of our website.

A public comment period will open soon so that anyone may submit written comments. In addition, a public hearing will be held at the Tumwater L&I building, exact date and time to be announced. Watch for updates on the Rule Development page and in next month’s newsletter.

For more details about the process, or to view or download rulemaking documents including the Second Draft, visit the Rule Development page of our website or see the August 2018 Special Edition Electrical Currents newsletter.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Ugly Picture of the Month: If viewing this document online, click on the picture to open a larger image. This creative method of adding service entrance conductors to two additional panels was discovered by one of our inspectors at a marijuana grow operation in need of more circuits and capacity for additional loads. There was a wad of tape on the split bolt when the inspector found it.

Answer to Question of the Month: As reported at the January 31 Electrical Board meeting, for last year about 49% of all journey-level exam candidates passed on the first attempt. Data compiled a couple years back indicates about 30% of those who did not complete an apprenticeship passed on the first attempt compared to almost 70% for those who completed an apprenticeship.
Question of the Month – When was the first National Electrical Code published?  See correct answer on Page 2.

100th Anniversary of Washington’s Electrical Licensing Law
House Bill 260 passed the legislature and was signed into law on March 11, 1919. The law created Washington’s first licensing and bonding requirements for electrical contractors. The title of H.B. 260 was: LICENSING AND BONDING OF ELECTRICIANS. An Act providing for the licensing and bonding of persons, firms or corporations engaged in or carrying on the business of installing wires to convey electric current, or electric apparatus to be operated by such current, prescribing the conditions of bonds and the rights of recovery thereof, and providing penalties for violations of this act.

You can view the original law on the Washington Legislature website at this link. Here are some of the highlights of the original law:

- Required license and bonding for persons, firms, or corporations that engage in, conduct or carry on the business of installing wires to convey electric current (similar to language in current law).
- License fee was $15.00 per year (about $200 in today's dollars). Current license fee is $277.60 per two years.
- Liability bond of $500.00 (about $7200 today) was required. Current bond amount required is $4000.00.
- Only applied in cities.
- Did not apply to wiring from the source of supply to the service switch, nor to work in connection with the lighting of streets, alleys, ways, or public parks, areas or squares.
- Did not apply to individuals, firms or corporations working on the premises or property owned by them.
- Failure to comply with this act was a misdemeanor.

The original licensing law did not provide for any installation standards. The next electrical law was 16 years later, in 1935 when House Bill 413 added permits, inspections, inspectors (at $1.00 per hour), National Electrical Code, and the appeals board.

Special thanks to Tom Baker of Puget Sound Electrical Training for his contribution to this article.

Legislative Update
So far, only one bill has been introduced that may affect the electrical laws of RCW 19.28. This bill is not sponsored by L&I. You can get information about this bill by clicking on the hyperlinked bill number below. Review the bill and comment if you desire. A comment button is located to the right of the bill number on the bill’s webpage.

House Bill 1594 – Provides an allowance for line workers to work on anything in the communications worker safety zone and supply space on utility poles supporting electric utility transmission or distribution lines without licensing, certification, or permits and inspections. Currently, according to L&I Division of Occupational Safety and Health (DOSH) rules, qualified electrical workers (i.e., line workers) must do all work in these spaces.

The bill also allows the installation of electric utility-owned equipment between meter bases and meters.

Rule Update – WAC 296-46B Revisions
Based on advice provided by the Technical Advisory Committee, and Electrical Board during their meeting in Tacoma on January 31, we have produced a Second Draft of the proposed rules and posted them on the Rule Development page of our website.
A public comment period will open soon so that anyone may submit written comments. In addition, a public hearing will be held at the L&I building, 7273 Linderson Way SW, Tumwater, WA. Exact date and time to be announced. Watch for updates on the Rule Development page and in next month’s newsletter.

For more details about the process, or to view or download rulemaking documents including the Second Draft, visit the Rule Development page of our website or see the August 2018 Special Edition Electrical Currents newsletter.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Invitation to a Stakeholder Meeting Near You

We are holding 19 electrical stakeholder meetings in various locations across the state between January and May 2019. These meetings are an opportunity to talk with the Chief Electrical Inspector in an informal setting. Check the schedule below and attend a meeting near you. We want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. Meeting dates and addresses are posted on our Electrical Calendar webpage. If you are not on the email list to receive these newsletters, you may join at our Electrical Email List webpage.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Address/Address Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 6</td>
<td>Tukwila – L&amp;I Building</td>
<td>12806 Gateway Dr. South, Rm C30</td>
</tr>
<tr>
<td>April 10</td>
<td>Everett – Snohomish County PUD</td>
<td>2320 California St, Commission Rm</td>
</tr>
<tr>
<td>April 11</td>
<td>Mount Vernon – NW WA Research and Ext Center</td>
<td>16650 SR 536</td>
</tr>
<tr>
<td>April 23</td>
<td>Okanogan – Okanogan PUD Auditorium, 1331 2nd Ave N.</td>
<td></td>
</tr>
<tr>
<td>April 24</td>
<td>Leavenworth – Chelan County PUD Auditorium, 222 Chumstick Hwy.</td>
<td></td>
</tr>
<tr>
<td>May 14</td>
<td>Spokane – Spokane Falls Community College</td>
<td>3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges</td>
</tr>
<tr>
<td>May 15</td>
<td>Colville – Spokane Community College</td>
<td>985 S Elm St., Combined Room</td>
</tr>
<tr>
<td>May 21</td>
<td>Kennewick – Benton PUD Auditorium</td>
<td>2721 West 10th Avenue</td>
</tr>
<tr>
<td>May 22</td>
<td>Moses Lake – L&amp;I Building</td>
<td>3001 West Broadway Avenue</td>
</tr>
<tr>
<td>May 16</td>
<td>Pullman – City Parks &amp; Rec, Barley Rm.</td>
<td>240 SE Dexter St.</td>
</tr>
<tr>
<td>May 23</td>
<td>Spokane – Spokane Falls Community College</td>
<td>3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges</td>
</tr>
<tr>
<td>May 24</td>
<td>Leavenworth – Chelan County PUD Auditorium, 222 Chumstick Hwy.</td>
<td></td>
</tr>
<tr>
<td>May 25</td>
<td>Yakima – Pacific Power Auditorium, 500 Keys Road</td>
<td></td>
</tr>
<tr>
<td>May 26</td>
<td>Pullman – City Parks &amp; Rec, Barley Rm.</td>
<td>240 SE Dexter St.</td>
</tr>
</tbody>
</table>

Picture of the Month: If viewing this document online, click on the picture to open a larger image. In the early 1930’s Bill Bergstrom and Irving Lassen founded Bergstrom’s Sporting Goods store on Fourth Avenue in Olympia, where the Spider Monkey tattoo parlor is now. Here, Bergstrom and Lassen show off a brace of fish caught with tackle from their store. Irving Lassen is the dapper gentleman at the left. He later founded Lassen Electric and, at his death, endowed the Lassen Foundation for the benefit of the people of Thurston County. Lassen Electric holds the distinction as being the longest continuously licensed active electrical contractor in Washington. Originally licensed as Sport & Electric Shop on January 2, 1935, Lassen Electric was later purchased by Joe and Donna Wiest, and is still owned and operated by the family today.

Answer to Question of the Month: In 1897, the National Board of Fire Underwriters published the first National Electrical Code “For the installation of wiring and apparatus for electric light, heat and power”. Many requirements are still very similar to the original. Here’s an excerpt from the first page of general suggestions: “In all wiring special attention must be paid to the mechanical execution of the work. Careful and neat running, connecting, soldering, taping of conductors and securing and attaching of fittings, are specially conducive to security and efficiency, and will be strongly insisted on.”

Photo by Vibert Jeffers, 1938, Susan Parish Collection, Southwest Regional Archives. Text courtesy of Olympia Historical Society and Bigelow House Museum (olympiahistory.org)
Question of the Month – Calculation of loads in accordance with the National Electrical Code (NEC) requires knowledge of the amount of power consumed by the circuits, feeders, and service. Power is expressed in volt-amperes or watts. How many volt-amperes are drawn by the following (assume 100 percent power factor). See correct answer on Page 2.

1) A 4.5 kilowatt (kw), 240-volt single-phase water heater.
2) A 10 ampere, 120-volt dishwasher.
3) A 5 horsepower, 460-volt three-phase air compressor.

Legislative Update

If you are part of the electrical or telecommunications industries regulated by L&I, lawmakers are considering bills that may affect you. Bills must be introduced and passed out of committee by February 22 to remain available for consideration.

So far, only one bill has been introduced that may affect the electrical laws of RCW 19.28. This bill is not sponsored by L&I. You can get information about this bill by clicking on the hyperlinked bill number below. Review the bills and comment if you desire. A comment button is located to the right of the bill number on each webpage. You may also contact your legislator to share your opinion about any legislation by visiting the legislative website at: http://www.leg.wa.gov/LIC/Pages/hotline.aspx.

House Bill 1594 – Provides an allowance for line workers to work on anything in the communications worker safety zone and supply space on utility poles supporting electric utility transmission or distribution lines without licensing, certification, or permits and inspections. Currently, according to L&I Division of Occupational Safety and Health (DOSH) rules, all work in these spaces must be done by qualified electrical workers (i.e., line workers). The bill also allows the installation of electric utility-owned equipment between meter bases and meters.

Rule Update – WAC 296-46B Revisions

Based on advice provided by the TAC, and Electrical Board during their meeting in Tacoma on January 31, we will produce a Second Draft of the proposed rules and post them on the Rule Development page of our website shortly.

Soon, there will be a public comment period and hearing where everyone will be able to give advice about the rules.

For more details about the process, to view or download rulemaking documents including the Second Draft, visit the Rule Development page of our website or see the August 2018 Special Edition Electrical Currents newsletter.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Invitation to a Stakeholder Meeting Near You

We are holding 19 electrical stakeholder meetings in various locations across the state between January and May 2019. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. We want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. Meeting dates and addresses are posted on our Electrical Calendar webpage and distributed on the program email list. If you are not on the email list, you may join at our Electrical Email List webpage.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.Lni.wa.gov

Electrical Section Internet Address:  http://www.ElectricalProgram.Lni.wa.gov/
Exceptions Offered for Untimely Affidavits of Experience

Affidavits of experience must be submitted at the time of renewal of a training certificate. We have seen too many affidavits of experience denied because they were turned in later than allowed. We are improving our communication about requirements and offering a one-time exception as follows:

- Affidavits for legally obtained hours worked on or after June 30, 2014 are eligible for consideration if received before July 1, 2019. Hours worked before June 30, 2014, are not eligible. This exception applies to all affidavits received through June 30, 2019. We are reviewing untimely affidavits and crediting hours accordingly.

- Beginning July 1, 2019, trainees must turn in affidavits of experience for the prior 2 years within 180 days from the date when their certificate expires. Untimely affidavits will be denied.

The requirements above do not apply to hours worked by apprentices while registered in a recognized electrical construction trade apprenticeship.

For questions about this opportunity, please email us at ElectricalProgram@lni.wa.gov, or give us a call 360-902-5269.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. How many electrical hazards can you spot with this property-owner installed service for an RV? Washington allows any property owner to perform electrical work regardless of qualifications. An inspector caught this unsafe installation before it killed someone. For bonus points, if this were energized, would it blow the overcurrent device supplying it? What would the voltage be across the 120-volt receptacles?

Answer to Question of the Month:

1) 4500 volt-amperes  
   (4.5 kW X 1000 W/kW ÷ 1.0 power factor);  

2) 1200 volt-amperes  
   (10 amperes X 120 volts);  

3) 6,311 volt-amperes  
   (7.6 amperes X 480V X √3) See NEC Table 430.250 for 3-phase motor full-load current. V (square root) of 3 = 1.73 (3-phase power formula).
Question of the Month – The total calculated service load for a 12-unit multifamily dwelling building is 137,500 volt-amperes. Each unit will be fed with a 120/208 volt single-phase feeder originating from a three-phase service. Using the standard calculation what is the calculated load in amperes on the service phase conductors? A) 1146 amps, B) 661 amps, C) 382 amps, D) 286 amps. See correct answer on Page 2.

No L&I Electrical Inspections on January 9 – Statewide Electrical Inspector Training

Training for all L&I electrical inspectors is happening on January 8 – 10, 2019. January 9 will be the only day attended by all L&I inspectors, no inspections will be performed that day. On January 8 & 10, inspectors will be available but at reduced capacity. We regret the inconvenience this causes, but we have found that a statewide approach improves consistency and is the most efficient use of our training budget. Please let your customers know and plan for inspections accordingly.

Invitation to a Stakeholder Meeting Near You

We are holding 19 electrical stakeholder meetings in various locations across the state between January and May 2019. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. We want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. Meeting dates and addresses will also be posted on our Electrical Calendar webpage and distributed on the program email list. If you are not on the email list, you may join at our Electrical Email List webpage.

<table>
<thead>
<tr>
<th>2019 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>January 22</strong> – Tumwater – <strong>L&amp;I Building Auditorium</strong> - 7273 Linderson Way SW</td>
</tr>
<tr>
<td><strong>January 23</strong> – Aberdeen – <strong>L&amp;I Building</strong> 415 W Wishkah St, Suite B, Rm 112</td>
</tr>
<tr>
<td><strong>February 5</strong> – Vancouver – <strong>L&amp;I Building</strong> – 312 E Stonemill Dr. Suite 120, Room C49</td>
</tr>
<tr>
<td><strong>February 6</strong> – White Salmon – <strong>White Salmon Valley Library</strong> – 77 NE Wauna Ave</td>
</tr>
<tr>
<td><strong>February 7</strong> – Kelso – <strong>L&amp;I Building</strong>, 711 Vine St. Room R11</td>
</tr>
<tr>
<td><strong>February 26</strong> – Tacoma – <strong>L&amp;I Building</strong> 950 Broadway, Orcas Room, 5th floor</td>
</tr>
<tr>
<td><strong>February 27</strong> – Sequim – <strong>Clallam County PUD</strong>, 104 Hooker Rd, Lake Crescent Room.</td>
</tr>
<tr>
<td><strong>February 28</strong> – Silverdale – <strong>L&amp;I Building</strong> 10049 Kitsap Mall Blvd NW Suite 100</td>
</tr>
<tr>
<td><strong>March 6</strong> – Tukwila – <strong>L&amp;I Building</strong> 12806 Gateway Dr. South, Rm C30</td>
</tr>
<tr>
<td><strong>April 10</strong> – Everett – <strong>Snohomish County PUD</strong> – 2320 California St, Commission Rm</td>
</tr>
<tr>
<td><strong>April 11</strong> – Mount Vernon – <strong>NW WA Research and Ext Center</strong>, 16650 SR 536</td>
</tr>
<tr>
<td><strong>April 23</strong> – Okanogan – Okanogan PUD Auditorium, 1331 2nd Ave N.</td>
</tr>
<tr>
<td><strong>April 24</strong> – Leavenworth – Chelan County PUD Auditorium, 222 Chumstick Hwy.</td>
</tr>
<tr>
<td><strong>April 25</strong> – Yakima – Pacific Power Auditorium, 500 Keys Road</td>
</tr>
<tr>
<td><strong>May 14</strong> – Spokane – <strong>Spokane Falls Community College</strong>, 3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges</td>
</tr>
<tr>
<td><strong>May 15</strong> – Colville – <strong>Spokane Community College</strong>, 985 S Elm St., Combined Room</td>
</tr>
<tr>
<td><strong>May 16</strong> – Pullman – City Parks &amp; Rec, Barley Rm. – 240 SE Dexter St.</td>
</tr>
<tr>
<td><strong>May 21</strong> – Kennewick – <strong>Benton PUD</strong> Auditorium – 2721 West 10th Avenue</td>
</tr>
<tr>
<td><strong>May 22</strong> – Moses Lake – <strong>L&amp;I Building</strong> 3001 West Broadway Avenue</td>
</tr>
</tbody>
</table>

Safety Tip of the Month

In the coming months, be prepared for deteriorating driving conditions. Rain, fog, ice, and snow are on the way. Slow down and increase your following distance to help compensate for decreased traction and visibility. Make sure your windshield wipers work well and wiper fluid is full. To help prepare for winter driving, see the Winter Travel page on the Washington Department of Transportation website.
Rule Update – WAC 296-46B Revisions

The Technical Advisory Committee (TAC) met on December 5 in Tacoma and gave L&I input regarding department and stakeholder rule proposals. Based on advice provided by the TAC on the proposals, we have produced a First Draft of the proposed rules. Additional advice will come from board members during the next regular Electrical Board Meeting on Thursday, January 31 in the Orcas Room of the Rhodes Center, 949 Market St., in Tacoma.

Soon, there will be a public comment period and hearing where everyone will be able to give advice about the rules.

For more details about the process, to view or download rulemaking documents including the First Draft, visit the Rule Development page of our website or see the August 2018 Special Edition Electrical Currents newsletter.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Plug-in Household Appliances

RCW 19.28.006(9) exempts plug-in appliances from all the requirements of chapter 19.28 RCW (e.g., licensing, certification, permitting, inspection, etc.). For this exemption, appliances are limited, by the definition in WAC 296-46B-100 to household appliances. For any other appliance (e.g., hard wired household appliances, and all non-household appliances), all the requirements of chapter 19.28 RCW apply.

There is another exemption in WAC 296-46B-925(10) from licensing and certification requirements for the installation of plug and cord connected utilization equipment (other than plug-in household appliances which are completely exempt). The plug and cord must be a single listed unit consisting of a molded plug and cord and not exceeding 250 volts 60 amperes single-phase. The plug and cord can be field installed per the manufacturer’s instructions and the product listing requirements. The utilization equipment must be a single manufactured unit, including the plug and cord, that does not require any electrical field assembly except for the installation of the plug and cord and is allowed to be plug and cord connected by the NEC. Electrical servicing, maintenance, or repairing of plug-in equipment or appliances, other than plug-in household appliances, are not included in this exemption and must be done by certified electricians and licensed electrical contractors.

For more information, see the Appliance Installation & Repair page of our website.

Ugly Picture: If viewing this document online, click on the picture to open a larger image.

Pictured is a creative and dangerous way to control appliances. Hot gloves recommended! The sign on top of the grill says to be sure to unplug after use. “Its’ been left on overnight a few times”. The dangerous wiring has been removed.

Answer to Question of the Month: C) 382

amps. 137,500 VA ÷ (208 V X 1.732 (square root of 3)) = 382 A.
Question of the Month – If a dispute arises regarding the interpretation of adopted state electrical standards, rules, or policies, who is responsible for making the final determination? See correct answer on Page 2.

No L&I Electrical Inspections on January 9 – Statewide Electrical Inspector Training
Training for all electrical inspectors is happening on January 8 – 10, 2019. To relieve some of the impact, January 9 will be the only day attended by all L&I inspectors, no inspections will be performed that day. On January 8 & 10, inspectors will be available but at reduced capacity. We regret the inconvenience this causes, but we have found that a statewide approach improves consistency and is the most efficient use of our training budget. Please let your customers know and plan for inspections accordingly.

Invitation to a Stakeholder Meeting Near You
I am holding 19 electrical stakeholder meetings in various locations across the state between January and May, 2019. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. Meeting dates and addresses will also be posted on our Electrical Calendar webpage and distributed on the program email list. If you are not on the email list, you may join at our Electrical Email List webpage.

<table>
<thead>
<tr>
<th>2018 Stakeholder Meetings 6 – 8 p.m.</th>
<th>2018 Stakeholder Meetings 6 – 8 p.m.</th>
<th>2018 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 22 – Tumwater – L&amp;I Building Auditorium - 7273 Linderson Way SW</td>
<td>January 23 – Aberdeen – L&amp;I Building 415 W Wishkah St, Suite B, Rm 112</td>
<td>February 5 – Vancouver – L&amp;I Building 312 E Stonemill Dr. Suite 120, Room C49</td>
</tr>
<tr>
<td>February 27 – Sequim – Clallam County PUD, 104 Hooker Rd, Lake Crescent Room.</td>
<td>February 28 – Silverdale – L&amp;I Building 10049 Kitsap Mall Blvd NW Suite 100</td>
<td>March 6 – Tukwila – L&amp;I Building 12806 Gateway Dr. South, Rm C30</td>
</tr>
<tr>
<td>April 10 – Everett – Snohomish County PUD – 2320 California St, Commission Rm</td>
<td>April 11 – Mount Vernon – NW WA Research and Ext Center, 16650 SR 536</td>
<td>April 23 – Okanogan – Location yet to be determined</td>
</tr>
<tr>
<td>April 24 – Wenatchee – Location yet to be determined</td>
<td>April 25 – Yakima – Location yet to be determined</td>
<td>May 14 – Spokane – Spokane Falls Community College, 3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges</td>
</tr>
<tr>
<td>May 15 – Colville – Spokane Community College, 985 S Elm St., Room TBA</td>
<td>May 16 – Pullman – Location yet to be determined</td>
<td>May 21 – Kennewick – Benton PUD Auditorium – 2721 West 10th Avenue</td>
</tr>
<tr>
<td>May 22 – Moses Lake – L&amp;I Building 3001 West Broadway Avenue</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

New – Rapid Shutdown of PV Systems Inside the Array Boundary Effective January 1, 2019
Effective January 1, 2019, requirements in NEC 690.12(B)(2) for rapid shutdown of conductors and/or equipment inside the array boundary will be enforced. If you install or inspect PV systems, review NEC 690.12(B)(2) for three options to comply with the rapid shutdown requirements within the array boundary.

Safety Tip of the Month
According to OSHA, an average of 14 workers are killed on the job every day. Excluding highway collisions, the four leading causes of construction worker fatalities are:

- Falls
- Struck by an object
- Electrocutions
- Caught in or between objects

Please watch for and eliminate these “Fatal Four” hazards in your workplace.
Rule Update – WAC 296-46B Revisions

The Technical Advisory Committee (TAC) is scheduled to meet December 5 in Tacoma in the Orcas Room of the Rhodes Center, 949 Market St. at 8:30 a.m. The meeting will be open to anyone, but input on proposals is limited to committee members. After considering advice from the TAC and Electrical Board, a public comment period and public hearing will be announced, providing further opportunities for comment on proposed rules.

Visit the Rule Development page of our website to view rule proposals, the TAC member roster, and other information.

Two new laws made rulemaking necessary. The new laws are:

- **Substitute Senate Bill 6126** requires completion of an apprenticeship to qualify for the journey-level electrician exam beginning July 1, 2023.
- **Engrossed Substitute House Bill 1952** allows city electrical inspection jurisdictions to enforce electrical licensing, certification, and trainee supervision laws.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Exceptions Offered for Untimely Affidavits of Experience

We have seen too many affidavits of experience denied because they were turned in later than allowed. We have heard you; we understand the impacts. We are improving our communication about requirements and offering a one-time exception as follows:

- Affidavits for legally obtained hours worked on or after June 30, 2014 are eligible for consideration if received before July 1, 2019. Hours worked before June 30, 2014, are not eligible.
  
  This exception applies to all affidavits received through June 30, 2019. We are reviewing untimely affidavits and crediting hours accordingly.

- Beginning July 1, 2019, trainees must turn in affidavits of experience for the prior 2 years within 180 days from the date when their certificate expires. Untimely affidavits will be denied.

The requirements above do not apply to hours worked while a registered apprentice is in a recognized electrical construction trade apprenticeship program.

Recently, we sent a letter to all active trainees and electrical contractors about the exceptions offered for untimely affidavits of experience. If you are one of those, and did not receive a letter, please update your address at:

https://www.Lni.wa.gov/TradesLicensing/LicensingReq/Legal.asp

For questions about this opportunity, please email us at ElectricalProgram@Lni.wa.gov, or give us a call 360-902-5269.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. A dangerous double-ended male cord was used to provide power to this juice bar across the parking lot from a store. In the lower right picture you can see the crude splice where two cords with male ends were connected together. While a mom was buying a drink, her toddler pulled the cord out and was shocked. Fortunately, the toddler survived, but had severe burns. The electrical inspector disconnected the installation, destroyed the cord and issued the installer, (not an electrician) three citations for the very dangerous installation.

Answer to Question of the Month: RCW 19.28.321 – The chief electrical inspector, subject to the review of the director shall provide the final interpretation of the disputed standard, rule, or policy.
Question of the Month – When sizing grounded service entrance, feeder, or branch-circuit conductors, it is important to know what type of load is being supplied by the conductors to prevent overheating and damage to conductors and equipment. An informational note in NEC 220.61(C) states.

A 3-phase, 4-wire, wye-connected power system used to supply power to nonlinear loads may necessitate that the power system design allow for the possibility of high harmonic neutral conductor currents. What are nonlinear loads? See correct answer on Page 2.

Rule Update – WAC 296-46B Revisions

The process for revising WAC 296-46B is underway. The department accepted revision proposals and applications to serve on the Technical Advisory Committee (TAC) in September and October. The August 2018 Special Edition newsletter gave details about how to be involved in the rulemaking process to update the electrical rules.

We are in the process of compiling proposals and selecting members for the TAC committee, which will meet December 5 in Tacoma. If you are selected to serve on the TAC committee, you will be notified shortly, and will receive all proposals to review prior to the meeting where the department will receive advice from the TAC committee. Proposals will also be posted on the Rule Development page of our website.

The passage of two laws affecting electrical stakeholders require rulemaking. They are:

- Substitute Senate Bill 6126 requires completion of an apprenticeship to qualify for the journey-level electrician exam beginning July 1, 2023.
- Engrossed Substitute House Bill 1952 allows city electrical inspection jurisdictions to enforce electrical licensing, certification, and trainee supervision laws.

As required, L&I provided public notice about this rulemaking by filing a CR101 in September. As the proposal process moves forward, there will be opportunities to provide written comments or present testimony at public hearings. See the Rule Development page of our website for more information.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Exceptions Offered for Untimely Affidavits of Experience

We have seen too many affidavits of experience denied because they were turned in later than allowed. We have heard you; we understand the impacts. We are improving our communication about requirements and offering a one-time exception as follows:

- Affidavits for legally obtained hours worked on or after June 30, 2014 are eligible for consideration if received before July 1, 2019. Hours worked before June 30, 2014, are not eligible.
  This exception applies to all affidavits received through June 30, 2019. We are reviewing untimely affidavits and crediting hours accordingly.
- Beginning July 1, 2019, trainees must turn in affidavits of experience for the prior 2 years within 180 days from of the date when their certificate expires. Untimely affidavits will be denied.

Safety Tip of the Month

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

Place generators so that exhaust fumes will not enter the building through windows, doors, or other openings. You can download a helpful generator safety publication from the National Fire Protection Association here.
The requirements above do not apply to hours worked while a registered apprentice in a recognized electrical construction trade apprenticeship program.

For questions about this opportunity, please email us at ElectricalProgram@lni.wa.gov, or give us a call 360-902-5269.

Residential Specialty Scope of Work -- Was Three Stories for Multifamily - Now Six – Why?

Dwellings located over other occupancies like commercial spaces and public parking garages are common. Most are five over two’s - five stories of dwellings over 2 stories of commercial space and parking. Often, O2 residential contractors, electricians, and trainees are able to wire the dwellings if nonmetallic-sheathed cable is permitted.

The NEC once restricted the use of nonmetallic-sheathed cable to three stories. This is why the O2 residential specialty in WAC 296-46B-920(2)(a) had a limit to match. Now, the NEC permits use by Building Construction Types. There are five Building Construction Types - Types I-V. The higher the number, the less resistance to fire. The NEC permits use of nonmetallic-sheathed cable in Building Construction Types III, IV, and V.

Generally, nonmetallic-sheathed cable is not permitted in a building if a firefighter cannot get to the highest floor with a 75-foot ladder. Taller buildings are required to be more fire resistant. Building Construction Type I usually applies to tall buildings. Nonmetallic-sheathed cable is not permitted in Types I and II.

To determine Building Construction Types, rely on the building plans approved by a local building official. Approved plans include an architectural analysis that calls out Building Construction Types. It is normal for buildings to use several Building Construction Types.

To determine if the nonmetallic-sheathed cable is within the O2 residential scope of work, look at the building plans. Are there no more than six stories of multifamily dwellings of Types III, IV, or V construction above grade or above Types I or II construction? Is the local building code going to allow nonmetallic-sheathed cable? If so, multifamily sections of the building are within the O2 residential scope of work. Scope is limited to installation of non-metallic sheathed cable, except for services and/or feeders, exposed installations where physical protection is required, and for wiring buried below grade. Ancillary areas, equipment, and systems directly associated with the functionality of the residential unit areas are within the O2 residential scope as allowed in WAC 296-46B-920(2)(a)(i).

Hourly rated building separations – walls, floors, and ceilings – between Building Construction Types or types of occupancies often establish scope of work boundaries. A typical five over two has an hourly-rated horizontal building separation between the second and third stories. If you are a O2 residential specialty contractor, electrician or trainee, your scope of work limits you to working within the multifamily occupancy - meaning no work whatsoever in other occupancies. This means electricians certified to work in all occupancies take over any wiring passing between occupancies. They also install any wiring and equipment that is not ancillary to the dwelling occupancy, like that described in WAC 296-46B-920(2)(a)(ii).

If you have questions, about what is included or not included in a scope of work, send us an email at ElectricalProgram@Lni.wa.gov or give us a call at 360-902-5249.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. While inspecting for a homeowner, an inspector found this dangerous installation using energized service conductors for temporary power. The inspector contacted the utility and power was disconnected.

Answer to Question of the Month: NEC 100 – Nonlinear loads:
A load where the wave shape of the steady-state current does not follow the wave shape of the applied voltage. Informational Note: Electronic equipment, electronic/electric discharge lighting, adjustable-speed drive systems and similar equipment may be nonlinear loads. These loads may cause higher current to flow in the grounded (neutral) conductor than ungrounded conductors causing potential overheating and damage to equipment and conductors. Certain installations may require grounded conductors to be larger than ungrounded conductors to prevent overheating – see NEC 310.15(A)(3).
Question of the Month – You are installing a feeder connected to an overcurrent device that does not have a listed continuous load rating. You have calculated the load for the feeder at 733,200 volt-amps, of which 388,800 is continuous load. What is the minimum ampacity for the 480V 3-phase feeder ungrounded conductors to supply this load? See correct answer on Page 2.

You Can Help Make Electrical Rules
You can submit a proposal or apply to serve on the Technical Advisory Committee (TAC). See the August 2018 Special Edition newsletter for details about how you can be involved in the rulemaking process to update the WAC 296-46B electrical rules.

From September 5, through October 19, 2018, we are accepting rule change proposals and applications for membership on the TAC committee. Complete details are in the August 2018 Special Edition newsletter.

The passage of two laws affecting electrical stakeholders require rulemaking. They are:

- Substitute Senate Bill 6126 requires completion of an apprenticeship to qualify for the journey-level electrician exam beginning July 1, 2023.
- Engrossed Substitute House Bill 1952 allows city electrical inspection jurisdictions to enforce electrical licensing, certification, and trainee supervision laws.

As required, L&I provided public notice about this rulemaking by filing a CR101 last month. As the proposal process moves forward, there will be opportunities to provide written comments or present testimony at public hearings. See the Rule Development page of our website for more information about how to participate, and to obtain a rule proposal form.

If you have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

Exceptions Offered for Untimely Affidavits of Experience
We have seen too many affidavits of experience denied because they were turned in later than allowed. We have heard you; we understand the impacts. We are improving our communication about requirements and offering a one-time exception as follows:

- Affidavits for legally obtained hours worked on or after June 30, 2014 are eligible for consideration if received before July 1, 2019. Hours worked before June 30, 2014, are not eligible. This exception applies to all affidavits received through June 30, 2019. We are reviewing untimely affidavits and crediting hours accordingly.
- Beginning July 1, 2019, trainees must turn in affidavits of experience for the prior 2 years within 180 days from of the date when their certificate expires. Untimely affidavits will be denied.

The requirements above do not apply to hours worked while a registered apprentice in a recognized electrical construction trade apprenticeship program.

If you have questions about this opportunity, please email us at ElectricalProgram@lni.wa.gov, or give us a call 360-902-5269.

Safety Tip of the Month
As an electrical professional, be alert for electrical hazards on the jobsite that may injure or kill unsuspecting co-workers. Never leave an energized electrical panel without a cover. Make sure receptacles used for temporary power are GFCI protected, and be on the lookout for improper temporary wiring splices and damaged cords or tools.
One-Line Diagram of Feeders Required For Inspection of Most Large Jobs

Feeders rated over 400 amperes (of any voltage), and those rated over 600 volts require a detailed one-line diagram to be available to the inspector during the first inspection. If not stamped by a professional engineer, the diagram must be signed and dated by the project owner (if they are doing the work) or the assigned administrator or master electrician of a contractor doing the work.

WAC 296-46B-215(1) Other than plan review projects, the installer must provide a one-line diagram showing the service and feeder details for the project before the initial inspection can be approved for all non-dwelling services or feeders:

(a) Larger than 400 amperes; or
(b) Over 600 volts.

The diagram must be signed and dated by the project owner if the owner is doing the work, the assigned administrator or master electrician if an electrical contractor is doing the work, or stamped with an engineer’s mark and signature who is registered under chapter 18.43 RCW. The diagram must show:

(c) All services including: wire size(s), wire type(s), service size(s) (e.g. voltage, phase, ampacity), overcurrent protection, available symmetrical fault current at the service point, equipment short-circuit rating, total load before and after demand factors have been applied including any demand factors used, and a panel schedule where multiple disconnecting devices are present; and

(d) All feeders including: wire size(s), wire type(s), feeder size(s) (e.g. voltage, phase, ampacity), overcurrent protection, total calculated load before and after demand factors have been applied including any demand factors used, and a panel schedule(s) where multiple disconnecting devices are present.

If the installer deviates, in any way, from the service/feeder design shown on the diagram, a supplemental diagram must be supplied to the inspector showing the most recent design before inspection can proceed. Load reductions and moving branch circuit locations within a panelboard do not require a supplemental diagram. Written documentation must also be provided to the inspector that the supplemental diagram was provided to the project owner at the time of submission to the inspector.

The diagram must be available on the job site during the inspection process.

System Design Review – Required for all PV and Wind Electric Systems

Just like the requirements for one-line diagrams for services and feeders, wind turbine and solar photovoltaic (PV) installers must provide detailed design documents when requesting an inspection. WAC 296-46B-690(3) and 694 require a system design review to be available to the inspector at the time of the first inspection.

WAC 296-46B-100 defines “System design review” as a set of design documents that include the manufacturer’s installation information, a legible one-line diagram of the system design, and calculations used to determine voltage and current within the system. The one-line diagram must show the system equipment, devices, overcurrent protection, conductor sizing, grounding, ground fault protection if required, and any system interconnection points. The review must be available to the inspector during all inspections.

Ugly Picture: If viewing this document online, click on the picture to open a larger image.

How many code violations can you spot? This is a new service for a recreational vehicle installed by a property owner and requested for inspection. One of our newer inspectors inspected it. In an email message to me, he said, “this is the first job I’ve inspected that absolutely would have self-destructed upon energization.” After the inspection, the owner hired a licensed electrical contractor to finish the job correctly. In this state, property owners without the slightest idea of safe wiring practices may perform any wiring on property they own. Luckily, the power company did not energize it without inspection.

Answer to Question of the Month: 1000 amperes – NEC 215.2(A)(1): Total load = noncontinuous load + 125% of continuous load. (733,200 – 388,800) + (388,800 X 1.25) = 830,400 volt-amps; 3 phase current = volt-amps ÷ (V X √3); 830,400 ÷ (480 X 1.73) = 1000
Question of the Month – When codes change and an effective date is set, when do your jobs have to comply with the new requirements? See correct answer on Page 2.

You Can Help Write the Electrical Rules - WAC 296-46B Updates

See the August 2018 Special Edition newsletter for details about how you can be involved in the rulemaking process. You can submit a proposal or apply to serve on the Technical Advisory Committee (TAC).

From September 5, through October 19, 2018, we will be accepting rule change proposals and applications for membership on the TAC committee. Complete details are in the August Special Edition newsletter.

We are updating the rules because of the passage of two laws affecting electrical stakeholders. They are:

- Substitute Senate Bill 6126 requires completion of an apprenticeship to qualify for the journey-level electrician exam beginning July 1, 2023.
- Engrossed Substitute House Bill 1952 allows city electrical inspection jurisdictions to enforce electrical licensing, certification, and trainee supervision laws.

As a required part of the rulemaking process, L&I will file a preproposal (CR101), with the state Office of the Code Reviser this month. There will be opportunities to provide written comments or present testimony at public hearings. See the Rule Development page of our website for additional information about how to participate in the process, and to download the proposal form for 2019 WAC 296-46B rule changes.

If you need additional information or have any questions, please contact Alicia Curry, at 360-902-6244 or Alicia.Curry@Lni.wa.gov.

No Trespassing Signs? Really? Let us Know We Have Access

This happens too often. Someone requests an electrical inspection and when we arrive, we see something like this. An inspector took these pictures when he arrived at the site to do the inspection. He probably could have issued a trip fee and walked away, but he took the time to make a phone call instead. The customer assured him that a dog was not waiting to attack and there would be no armed response. Please help us serve you better by communicating any special access instructions to us in the comments field of your inspection request.

Here’s What We Accomplished in Fiscal Year 2018

Increased demand for permits, inspections, plan review, and licensing reflect Washington’s healthy construction economy.

Here is what happened in FY18 (July 1, 2017 through June 30, 2018), which demonstrates the amount of work performed by our dedicated staff:

- 147,186 electrical permits sold, 94% were purchased online.
- 246,628 electrical inspection requests were made, 83% were requested online.
- Over 2.4 million miles were driven with 12 at-fault accidents, mostly minor fender-benders.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to:


Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
• System improvements now provide near real-time inspection results. Most customers received an email message with their inspection results immediately after the inspection.
• Inspectors issued 46,232 corrections for serious code violations. These represent about half of total corrections and are violations that could result in disconnection of power if not corrected. By far, property owner permits are most likely to receive serious corrections. Inspectors issued at least one serious correction for 50% of property owner inspections, compared to 15% for electrical contractor inspections.
• Our inspection response times improved significantly. For FY18, we responded to approximately 82% of inspections within 24 hours of the date requested and 93% within 48 hours. While this is an improvement over last year, this means that 17,508 times, customers had to wait more than 48 hours for inspection. Number of inspectors, workload, and inspections in remote areas of the state affect response times. Filling vacant positions and getting new inspectors trained and working efficiently will be key to improving our response times.
• Speaking of training, since our formal inspector training program was established in 2013, over 100 inspectors have completed basic inspector training. Over half of our 133 inspectors have less than 5 years’ experience with the department. All new inspectors must complete a two-year training program.
• Our team of dedicated plans examiners reviewed over 6,300 pages of drawings for educational, institutional, or health care facilities to ensure the design for these facilities meets the minimum requirements for electrical safety. The average backlog for a set of plans awaiting review in FY18 was 2.1 weeks. An electronic plan review system is coming soon.
• Typically, 20% of contractors receive 80% of corrections. The correction reduction initiative helped contractors identified as having the most corrections per inspection the prior fiscal year realize a 29.2% decrease in the number of corrections they received. Each month, contractors in this group get a list of their corrections and are encouraged to use the information to help their electricians make safer installations.
• 5,066 citations were issued for the focused underground economy violations of the electrical laws. These violations include failing to obtain electrical permits, unlicensed electrical contractors, uncertified electricians, and failing to properly supervise trainees. This is an increase from the previous year’s 3,557 citations. It is mostly due to the E-CORE team finding many non-compliant jobs involving out-of-state unlicensed contractors and electricians performing work at large retail chains. Many of these jobs were taken over and completed by licensed electrical contractors.
• The licensing section processed 27,939 licenses (contractor, electrician, and trainee applications, and renewals). Almost 100% of these were processed the same day they were received.

Our auditors reviewed 1,753,678 electrical trainee and out-of-state hours to qualify for electrical certification examinations. Of those, 1,137,872 were denied. These numbers are very close to the totals from the last fiscal year. Reasons for denial include not able to verify out-of-state experience, no active training certificates, lack of proper supervision (sometimes no certified electricians on staff), not able to verify employment (no legal employment records), no electrical permits to verify work performed, and lack of valid contractor licensing.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. Property owners may perform any electrical work on property they own. This is an example of the many dangerous wiring hazards our inspectors discover on permits purchased by property owners. Sliding a plumbing elbow over service entrance conductors can easily damage them causing the isolated ungrounded metal elbow to be energized, creating a potential shock and fire hazard.

Answer to Question of the Month: The date the permit was purchased determines what code requirements apply. For example, last month’s article discussed a new requirement for PV rapid shutdown inside the array boundary, which will be effective January 1, 2019. L&I will enforce this requirement on all jobs where the customer purchases the permit on or after that date.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.Lni.wa.gov
Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
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 & Industries is an Equal Opportunity employer.
WAC 296-46B Revisions

The Department Is Seeking Stakeholder Input for Proposed Rule Changes

The department is beginning the process of revising Washington Administrative Code (WAC) 296-46B – Electrical Safety Standards, Administration, and Installation rules to align them with new legislation that passed in the recent legislative session as well as to make housekeeping changes, adopt the 2020 National Electrical Code (NEC) to be effective (tentatively) July 1, 2020, and accept proposals from stakeholders. Any stakeholder in the electrical industry may make proposals for additions and/or revisions to WAC 296-46B. Proposals from stakeholders may be submitted from September 5, 2018 through October 19, 2018. 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 for development of 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.

A sample Proposal Form for 2019 WAC 296-46B Rule Changes is shown on page four of this edition. All proposals must be submitted using an electronic MS Word version of this form which is available on our Rule Development page at: http://www.Lni.wa.gov/TradesLicensing/Electrical/LawRulePol/RuleDev/default.asp

Stakeholder proposals must be received from 12:01 a.m. September 5, 2018 through 11:59 p.m. October 19, 2018. Any proposal received before or after these dates will be rejected. All proposals must be made electronically using the form supplied by the department.

The submitter must submit a proposal(s) by sending the proposal(s) as an email attachment to ElectricalWAC@lni.wa.gov. Please do not attempt to submit early, as this email address will not function until September 5, 2018.

Proposed revisions should include the relevant existing text and should use 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).

Proposals not submitted according to these instructions will be rejected.

Technical Advisory Committee (TAC)

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

Persons interested in becoming TAC members must submit a letter of interest for specific positions to the Chief Electrical Inspector by email to ElectricalWAC@lni.wa.gov to be received from September 5, 2018 through October 19, 2018. The letter should state the position applied for and show constituency support for
the prospective member. Include an email address and daytime phone number for the applicant. 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 35 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 designate an alternate to 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:

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

The TAC will operate on a majority basis. A majority vote of members in attendance in support of a motion 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. Public testimony will not be received during the TAC meeting. Opportunity for public comment will be provided at a later date (see below).

● 2019 WAC Revision Process – Proposed Sequence of Events

- September 5 through October 19, 2018 – Accept proposals from stakeholders to amend or add to the existing WAC 296-46B.
- September 5 through October 19, 2018 – Accept applications for TAC.
- Early December – TAC meeting (exact date and location TBA).
- January 2019 – Electrical Board review and recommendation on proposals.
- February 2019 – File CR 102 – rule filing (opens the official required public comment period).
- March 2019 – Public hearing(s).
- June 1, 2019 – Revised rule becomes effective.

● General TAC – Membership

Chairperson – Chief Electrical Inspector (non-voting)

<table>
<thead>
<tr>
<th>2</th>
<th>Electrical Board Members (non-voting)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Training School Representative</td>
</tr>
<tr>
<td>1</td>
<td>Continuing Education Provider</td>
</tr>
<tr>
<td>2</td>
<td>Electrical Apprenticeship Representatives</td>
</tr>
<tr>
<td>1</td>
<td>Electrical Manufacturer Representative</td>
</tr>
<tr>
<td>2</td>
<td>L&amp;I Inspection (Supervisor &amp; Inspector)</td>
</tr>
<tr>
<td>2</td>
<td>City Regulator (Supervisor &amp; Inspector)</td>
</tr>
<tr>
<td>1</td>
<td>Plumber (Contractor or Worker)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1</th>
<th>WA Manufacturing Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Electrical Engineer</td>
</tr>
<tr>
<td>1</td>
<td>Electrical Testing Laboratory</td>
</tr>
<tr>
<td>1</td>
<td>Electric Utility Representative</td>
</tr>
<tr>
<td>1</td>
<td>General Public Member</td>
</tr>
<tr>
<td>10</td>
<td>Electricians</td>
</tr>
<tr>
<td>10</td>
<td>Electrical Contractors</td>
</tr>
</tbody>
</table>

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.
Notes:

- Contractor positions must be filled by a member of the firm or assigned administrator/master electrician of a licensed electrical/telecommunications contractor or representative of an electrical contractors’ association in Washington representing that specialty.
- Electrician positions must be filled by a certified electrician who is not a member of the firm or assigned administrator/master electrician in an electrical contracting business.
- The AD HOC contractor and electrician positions must be filled by a specialty not otherwise represented on the TAC.
- 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.

### Methodology for Determining the Number of Electrical Contractor and Electrician Members

<table>
<thead>
<tr>
<th>Active Licenses &amp; Certificates</th>
<th># of Contractors</th>
<th>% of All Licenses</th>
<th># of TAC Members</th>
<th># of Electricians</th>
<th>% of All Certificates</th>
<th># of TAC Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>2,782</td>
<td>54.4%</td>
<td>5</td>
<td>17,620</td>
<td>61.1%</td>
<td>6</td>
</tr>
<tr>
<td>02</td>
<td>320</td>
<td>6.3%</td>
<td></td>
<td>2,225</td>
<td>7.7%</td>
<td></td>
</tr>
<tr>
<td>03</td>
<td>121</td>
<td>2.4%</td>
<td></td>
<td>335</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>03A</td>
<td>49</td>
<td>1.0%</td>
<td></td>
<td>119</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>04</td>
<td>84</td>
<td>1.6%</td>
<td></td>
<td>261</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>548</td>
<td>10.7%</td>
<td>1</td>
<td>2,982</td>
<td>10.3%</td>
<td>1</td>
</tr>
<tr>
<td>06A</td>
<td>647</td>
<td>12.7%</td>
<td>1</td>
<td>3,435</td>
<td>11.9%</td>
<td>1</td>
</tr>
<tr>
<td>06B</td>
<td>13</td>
<td>0.3%</td>
<td></td>
<td>131</td>
<td>0.5%</td>
<td></td>
</tr>
<tr>
<td>07</td>
<td>98</td>
<td>1.9%</td>
<td></td>
<td>1,104</td>
<td>3.8%</td>
<td></td>
</tr>
<tr>
<td>07A</td>
<td>13</td>
<td>0.3%</td>
<td></td>
<td>69</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>07B</td>
<td>57</td>
<td>1.1%</td>
<td></td>
<td>233</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>07C</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td>22</td>
<td>0.1%</td>
<td></td>
</tr>
<tr>
<td>07D</td>
<td>43</td>
<td>0.8%</td>
<td></td>
<td>200</td>
<td>0.7%</td>
<td></td>
</tr>
<tr>
<td>07E</td>
<td>7</td>
<td>0.1%</td>
<td></td>
<td>69</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>09</td>
<td>298</td>
<td>5.8%</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>30</td>
<td>0.6%</td>
<td></td>
<td>56</td>
<td>0.2%</td>
<td></td>
</tr>
<tr>
<td>Ad Hoc Group</td>
<td>1,133</td>
<td>22.2%</td>
<td>3</td>
<td>4,824</td>
<td>16.7%</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>5,110</td>
<td>10</td>
<td>28,861</td>
<td>10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:  
- <10% of Licenses/Certificates joins the Ad Hoc group  
- The Ad Hoc group will be filled on an equitable basis with an emphasis on representation closely following the % of licenses.

- Unfilled positions will remain vacant.

### Keep Informed

There will not be a specific mailing list for this WAC revision process. Special WAC update postings will be maintained using the Electrical Program’s Electrical Email List, Rule Development page of our website, and Electrical Currents newsletter.

SAMPLE
**Question of the Month** – When are photovoltaic (PV) system output circuit conductors required to be marked to indicate their polarity? See correct answer on Page 2.

**Electrical Plan Review for Small Projects and Load Reductions**

In L&I jurisdictions, plan review is required for all new or altered electrical projects in educational, institutional, or health care occupancies by WAC 296-46B-900(3)(b). However, under certain conditions allowed under WAC 296-46B-900(3)(a), projects that result in an electrical load reduction and modifications to existing installations where the service or feeder load calculations are not increased by more than 5% may be exempted from formal plan review requirements (and associated fees).

For these types of installations to qualify as exempt, the following information must be submitted to the local L&I electrical inspection office and reviewed before the work is initiated:

- A clear and adequate description of the project’s scope;
- A load calculation(s);
- What the load changes are, providing both before and after panel schedules, as needed; and
- Provide information showing that the service and feeder(s) supplying the panel(s) where the work is taking place has adequate capacity for any increased load and has code compliant overcurrent protection for that supply.

**NICET Certification Required for Fire Alarm System Non-Electrical Tasks Effective July 1, 2018**

Local fire and building inspection jurisdictions are the authorities having jurisdiction for enforcement of NICET certification requirements described in WAC 51-50-907.10.3 for fire alarm inspection, testing maintenance not defined as “electrical construction trade” by RCW 19.28.006.

In accordance with RCW 19.28.211(4), a properly certified electrician working within the scope of his certificate cannot be required to have additional certification to work in the electrical construction trade. Local fire and building inspection jurisdictions will enforce NICET certification requirements, which will only apply to tasks that do not require the worker to hold an electrician’s certificate of competency under RCW 19.28.

**2020 NEC First Draft Report Published – Public Comment Period Now Open**

As discussed last month, you may now view the First Draft of the 2020 NEC. This opens the public comment period, which will close on August 30, 2018. You may view the First Draft and submit a public comment for consideration by the code-making panels by visiting the NFPA 70 Next Edition page of NFPA’s website. The code-making panels will consider all public comments, and a Second Draft Report will be posted in April 2019. The 2020 NEC will be published in August 2019 and will probably be adopted in Washington beginning July 1, 2020.

**NEW - Rapid Shutdown of PV Systems Inside the Array Boundary Effective January 1, 2019**

Since 2014, the NEC has required PV systems installed in or on buildings to have a rapid shutdown function to reduce shock hazard for emergency responders. Effective January 1, 2019, NEC 690.12(B)(2) will require rapid shutdown of...
conductors and/or equipment inside the array boundary. If you install or inspect PV systems, review NEC 690.12(B)(2) for three options to comply with the rapid shutdown requirements within the array boundary.

**Supply Side PV Interconnection Grounding, Bonding, and Wiring Methods**

The supply side interconnection described in NEC 705.12(A) is a very popular method of interconnecting an alternate power production source such as PV in parallel with a normal supply system of a building or structure. This connection may be made on the supply side of the service disconnecting means as permitted by 230.82(C). In addition, 230.2(A) permits a building or structure to have an additional service to supply a parallel power production system. When a supply-side interconnection is made, it must be installed using the wiring methods, grounding, and bonding as if it were a separate service. Overcurrent protection for electric power production source conductors must be located within 10 feet of the point where they are connected to the service entrance conductors. The disconnecting means for the alternate power production source is not required to be grouped with the normal building service disconnect(s), **WAC 296-46B-705** states that electric power production source conductors connected to the supply side of the service disconnecting means must be installed using wiring methods specified for service conductors in **WAC 296-46B-230**(7). In addition, the disconnecting means must be treated as an additional service disconnecting means for the purposes of grounding and bonding (i.e., main bonding jumper, grounding electrode conductor connected to the building electrode system, and bonding of services per NEC 250 Part V).

**PV Interconnection Rules Apply to Busbars in all Upstream Equipment**

When making an interconnection for an electric power production source such as a PV system in parallel with a utility service, rules must be followed to avoid overloading electrical conductors and equipment. NEC 705.12(B) says the output of an interconnected electric power production source may be connected to the load side of the service disconnecting means of the other source(s) at any distribution equipment on the premises. Interconnection of two sources of power in parallel have the potential to overload conductors and equipment if other loads are also being supplied. 705.12(B)(2) gives requirements for bus or conductor ampere ratings for feeders, taps, and busbars. Often, we receive questions about the protection of busbars upstream when the interconnection is made to a feeder or feeder panel downstream of the service panel. The rules for protecting busbars in 705.12(B)(2)(3) must be applied to all busbars in the current path from the point of interconnection upstream to and including the service panel for all busbars that also supply other loads. See the November and December 2014 newsletters for more details. The information is still accurate but some NEC article numbers have changed.

**Consideration of Fee Increase for Non-Electrical L&I Programs**

L&I is considering rule changes to increase fees for its Construction Contractor Registration, Elevator, and Factory Assembled Structures (FAS) programs. A fee increase is sought to cover increased operating expenses for inspections and other program public safety activities.

The rule changes under consideration would increase fees by the fiscal-growth factor rate of 4 percent. For example, a $60 fee would increase to $62.40.

As a required part of the rulemaking process, L&I filed a **preproposal (CR101)**, with the state Office of the Code Reviser on July 17, 2018. There will be opportunities to provide written comments or present testimony at public hearings. See the **L&I web site** for information about how to participate in the process.

If you need additional information or have any questions, please contact Alicia Curry, at 360-902-6244 or **Alicia.Curry@Lni.wa.gov**.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. Hmmm. I wonder what ill-conceived thought process produced this dangerous installation. Before the inspector took these pics, an electrical contractor discovered this and removed #10 conductors that were feeding a sub-panel from these screws.

**Answer to Question of the Month:** Where connected to energy storage systems. NEC 690.55
Question of the Month – You are installing a feeder from a remote service to a house. The calculated load for the house is 140 amperes and the length of the 4/0 aluminum conductors is 260 feet one-way. What is the percentage voltage drop for the 200-amp 120/240 volt feeder conductors? See answer on Page 2.

All Electrician Exams are Now Based on 2017 Codes
All exams given after June 30, 2018 will be based on the 2017 NEC, WAC, and RCW even if you are re-taking an exam or portion of an exam that was previously failed using a previous version. For more information about the exams, you can refer to WAC 296-46B-960 or visit the Electrical Exam Information page of our website.

Big Changes Coming for Trainees and Contractors – Apprenticeship Legislation Passed
Substitute Senate Bill 6126 passed by the legislature effects those training to become 01 general journey level electricians and those who employ them.

- Effective July 1, 2023, to be eligible for the (01) general journey level electrician examination, applicants must have completed a recognized (01) electrical apprenticeship program approved by the Washington State Apprenticeship Training Council (WSATC) or out-of-state equivalent. This requirement does not apply to those approved for an (01) examination before July 1, 2023 or to specialty electrician examination candidates.
- After June 30, 2023, unless working in a specialty, trainees must be registered apprentices or be enrolled in a two-year program in the electrical construction trade. Apprenticeship programs may credit properly documented electrical experience on record with the department such as, 4000-hour electrical specialty certification, military experience or completion of a two-year training school program.

Apprenticeship Roles
Apprentice—a person registered in an approved Washington State Apprenticeship and Training Council (WSATC) program or out-of-state equivalent. Apprentices must be employed by training agents.

Training Agent—as a training agent, contractors register with an existing apprenticeship program already training (01) general journey level electrician apprentices. The apprentice will continue working for you, receiving on-the-job training (OJT) while the existing apprenticeship program will provide tracking of OJT hours and the related classroom/lab training. This saves you the time and expense of creating your own program, and provides you the flexibility for getting started almost immediately.

Sponsor—creator of an apprenticeship program approved by the Washington State Apprenticeship and Training Council (WSATC) and registered with L&I.

Recognized (01) General Journey Level Electrician Apprenticeship Programs
- Construction Industry Training Council of Washington (CITC).
- Area 1 Inside Electrical JATC.
- Puget Sound Electrical Joint Apprenticeship and Training Committee.
- IBEW 48 NECA-IBEW Electrical JATC.
- Inland Empire Electrical Training Trust.
- Southwest Washington Electrical Joint Apprenticeship and Training Committee.
- LU 112 - NECA Electrical Apprenticeship Committee.
- Northwest Washington Electrical Industry Joint Apprenticeship and Training Committee.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov/
Want to Sponsor An Apprenticeship Program?

All sponsors for (01) general journey level electrician apprenticeship programs must adhere to Minimum Guideline Standards previously approved by the WSTAC. Follow this link to the Inside Electrician (01) Minimum Guideline Standards Template: https://www.lni.wa.gov/TradesLicensing/Apprenticeship/files/eforms/ApprenticeshipStandardsTemplateApp0005.docx

Registered apprenticeship programs start with the formation of an apprenticeship committee made up of industry members—both employers and employees.

For more information, contact a Labor & Industries Apprenticeship Consultant. Apprenticeship consultants are located all across the state. They will help you identify which type of apprenticeship model best suits your company and then provide one-on-one consulting and on-site assistance to get your program up and running. Contact information for Apprenticeship Consultants can be found at the following link:

http://www.lni.wa.gov/TradesLicensing/Apprenticeship/About/AppCoordinators/default.asp

Trainees Must Submit Affidavits of Experience Within 180 Days of Certificate Expiration

Please share this important message with all electrical trainees. To receive credit for experience worked in the electrical construction trade, trainees must submit an affidavit of experience in a timely manner. Be aware of your certificate expiration date. To continue working, you are required to renew your training certificate before the expiration date. You must submit affidavits of experience from your employer(s) for the previous two years within 180 days of the expiration date of your certificate, unless you are registered in a department-approved apprenticeship program. Upon request, employers are required to provide the previous period’s affidavit of experience to the trainee within 20 days of request in accordance with WAC 296-46B-942(12). There are two affidavit forms depending on the type of experience. They are available at these links:

Affidavit of Experience for 75% Supervision Specialties (for journey-level and 4000-hour specialty experience)
Affidavit of Experience for 100% Supervision Specialties (for 2000-hour sub-specialty experience)

When you renew, you must also have completed 48 hours of basic classroom instruction during the previous certificate period, or your certificate will be inactive until the training is completed.

2020 NEC First Draft Report Published – Public Comment Period Now Open

For a glimpse of what the next National Electrical Code (NEC) may be like, you may now view the First Draft of the 2020 NEC. The National Fire Protection Association (NFPA) published the First Draft on June 25, 2018. This opens the public comment period, which will close on August 30, 2018. You may view the First Draft Report and submit a public comment for consideration by the code-making panels by visiting the NFPA 70 Next Edition page of NFPA’s website. When you select First Draft Report or Submit a Public Comment, you will be taken to a page where you can sign in. If you haven’t already, you will need to set up a user name and password. It is free and allows you to submit public inputs and comments, and you can view any of NFPA’s codes and standards. The code-making panels will consider all public comments, and a Second Draft Report will be posted in April 2019. The 2020 NEC will be published in August 2019 and will probably be adopted in Washington beginning July 1, 2020.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. A property owner requested inspection on this new service (left pic), and was told by the inspector he could not install open service conductors within a wall. Sadly, the pic on the right shows the intended solution using water pipe discovered upon re-inspection. It appears this service could use a main bonding jumper as well.

Answer to Question of the Month: 3 percent. See the October 2017 newsletter article explaining voltage drop calculations. Voltage drop = (2 x K x I x L) ÷ wire circular mils.

(2 x 21.2 x 140 x 260) ÷ 211,600 = 7.29 volts. 7.29 ÷ 240 = .03
Question of the Month – What is the penalty for the first-time offense of causing or failing to correct a serious violation? (A serious violation is, among other things, one that creates a hazard of fire or danger to life safety). See correct answer on Page 2.

TIA 17-15 Issued by the NFPA - NEC Article 555
To help reduce Electric Shock Drowning (ESD) hazards, the NEC has specified ground-fault protection requirements for marinas in Article 555 since the 2011 edition. Recently, the NFPA added definitions to NEC 555.2 and revised NEC 555.3 through issuance of Tentative Interim Amendment (TIA) 17-15. The TIA clarifies application of Article 555 and allows coordination with downstream ground-fault protection at the feeder overcurrent device (i.e., by coordinating trip time settings so the downstream device trips first). The NEC requires all overcurrent devices supplying a docking facility to have ground-fault protection set to open when leakage current to ground (or water) exceeds 30-milliamperes. See WAC 296-46B-555 for amended feeder ground-fault protection levels.

For more information about ESD, visit www.electricshockdrowning.org.

Marina Feeder Ground-Fault Protection Rule Adopted
The department has adopted changes to WAC 296-46B-555 effective July 1, 2018. The revised rule amends the ground-fault protection levels specified in NEC 555.3 to allow 100-milliamperes protection for feeders not supplying primary windings of transformers. On September 1, 2019, the ground-fault protection requirements will be as published in the 2020 NEC. More information about rulemaking and the revised rule language can be found by visiting the Rule Development page of our website.

Inspector Training Milestone – 100 Inspectors Trained
Anticipating significant turnover in our inspector ranks, succession hiring and training began in 2013. A full-time trainer was established in 2014. Trainer Dennis Straley and a host of others have been busy providing formal training to newer inspectors. 100 inspectors have now completed basic inspector training since 2013.

Training is essential to ensuring statewide consistency. Over half of our 133 inspectors have less than 5 years’ experience with the department. Of those, about 40 percent have less than two years’ experience. All new inspectors must complete a two-year training program. We appreciate your patience and training assistance during this challenging transition.

We are hiring! If you would like to become an electrical inspector, visit the Find a Job at L&I page of our website and search “inspector”. Applications are taken on a statewide basis to fill vacancies as they occur.

All Exams Based on the 2017 NEC after June 30, 2018
After June 30, 2018, all electrical examinations will be based on the 2017 NEC, WAC 296-46B, and RCW 19.28. The Electrical Board, having responsibility for establishing and administering electrician examinations, endorsed this change.

Like the codes, laws, and rules they are based on, exam questions do not change significantly over time. All examinations are open-book and exam candidates can bring any original copyrighted reference material into the exam with them. Copies of RCW 19.28 and WAC 296-46B may be used. For more information about the exams, you can refer to WAC 296-46B-960 or visit the Electrical Exam Information page of our website.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to:

http://www.ElectricalCurrents.lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
Identification of Emergency System Circuits

**WAC 296-46B-700**(4) requires all boxes and enclosures for Article 700 NEC systems larger than 6 inches by 6 inches, including transfer switches, generators, and power panels for emergency systems and circuits to be permanently identified with an identification plate that is substantially orange in color. In existing health care facilities, the existing nameplate identification color scheme can be retained for transfer switches, generators, and power panels for existing emergency systems that are not being replaced or modified. All other device and junction boxes for emergency systems and circuits must be substantially orange in color, both inside and outside.

2017 NEC 700.10(A) expanded the requirements for identification of emergency system wiring to include identification of exposed cable or raceway systems as components of an emergency circuit or system at intervals not to exceed 25 feet where boxes or enclosures are not encountered. It also added a requirement that receptacles supplied from the emergency system shall have a distinctive color or marking on the receptacle cover plates or the receptacles.

For consistency, the department will require all of the above identification means to be substantially orange in color.

**Generator Prime Mover (Engine) Shutdown Requirements**

Disconnecting requirements for generators were reorganized for the 2017 NEC and requirements for shutdown of the prime mover (typically an engine) were added. The requirement for a disconnecting means to simultaneously open all ungrounded conductors associated with the generator in NEC 445.18(A) is essentially the same as in the 2014 edition.

2017 NEC 445.18(B) requires generators to have provisions to shut down the prime mover (i.e., kill the engine). The means of shutdown must comply with the following:

1. Be equipped with provisions to disable all prime mover start control circuits to render the prime mover incapable of starting.
2. Initiate a shutdown mechanism that requires a mechanical reset.

The provisions to shut down the prime mover shall be permitted to satisfy the requirements of 445.18(A) where it is capable of being locked in the open position in accordance with 110.25.

Generators rated greater than 15 kW shall be provided with an additional means to shut down the prime mover located outside the equipment room or generator enclosure and shall also meet the requirements of 445.18(B)(1) and (B)(2). The department will require shutdown means not attached to generators to have an identification plate to clearly indicate its purpose in accordance with NEC 110.22(A). See **WAC 296-46B-100** definition of “identification plate”.

Where a generator is installed in parallel with other generators, the provisions of 445.18(A) shall be capable of isolating the generator output terminals from the paralleling equipment. The disconnecting means shall not be required to be located at the generator.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. The open splice in this picture is intended by the installer to be concealed behind sheetrock and the luminaire base is not connected to the equipment grounding conductor. This is a good example of a serious violation, which would carry a substantial penalty and may result in suspension or revocation of the installer’s certificate of competency.

**Answer to Question of the Month:** $1000 - **WAC 296-46B-915** specifies the penalty amounts for this violation. Second offense is $3000 and the third offense is $5000. **WAC 296-46B-990** defines serious violation, which includes wiring that presents an imminent danger to the public by being installed in such a condition that a fire-hazard or a life-safety hazard is present. Examples include, but are not limited to, installing a shortened rod/pipe grounding electrode, improper splicing of conductors in conduits/raceways or concealed within walls, or installing a fake equipment grounding conductor. An act of serious noncompliance may also result in suspension or revocation of an electrical contractor’s license or an electrician’s, administrator’s, or master electrician’s certificate.
Question of the Month – Is electrical metallic tubing (EMT) an approved wiring method for installation of conductors for a supply-side interconnection of a solar photovoltaic system within a building between the point of interconnection and the overcurrent device protecting the electric power production source conductors? See correct answer on Page 2.

Invitation to a Stakeholder Meeting Near You
I have been holding 18 electrical stakeholder meetings in various locations across the state between March and May 2018. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. All meetings are 6 – 8 p.m.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Address and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 9</td>
<td>Silverdale –</td>
<td>L&amp;I Building – 10049 Kitsap Mall Boulevard NW Suite 100</td>
</tr>
<tr>
<td></td>
<td>Sequim – Clallam</td>
<td>PUD #1, 104 Hooker Road, West of Sequim off Hwy 101, Lake Crescent Board Room</td>
</tr>
<tr>
<td></td>
<td>Everett –</td>
<td>Snohomish County PUD Commission Meeting Room 2320 California Street</td>
</tr>
<tr>
<td>May 23</td>
<td>Mount Vernon –</td>
<td>Northwestern Washington Research and Extension Center – 16650 State Route 536</td>
</tr>
<tr>
<td></td>
<td>Vancouver –</td>
<td>Clark PUD – Electric Center Community Room, 1200 Fort Vancouver Way</td>
</tr>
<tr>
<td></td>
<td>White Salmon –</td>
<td>White Salmon Valley Community Library – 77 NE Wauna Avenue</td>
</tr>
<tr>
<td>May 31</td>
<td>Longview –</td>
<td>Lower Columbia College 1600 Maple, Health &amp; Science Building, HSB-101, Laufman Lecture Hall</td>
</tr>
</tbody>
</table>

Square D Safety Switches Recalled Due to Electrical Shock Hazard
In cooperation with the US Consumer Product Safety Commission, Schneider Electric has recalled approximately 1,079,000 Square D Safety Switches. The recall involves Square D general duty 30 & 60A, 120/240-volt, 2-phase and 3-phase NEMA 3R safety switches. The power can stay on when the safety switch handle is in the “OFF” position, posing an electrical shock or electrocution hazard to consumers. Affected products were manufactured from January 1, 2014 through January 18, 2018 (date codes 1401 through 1803 inclusive). For more information and a list of catalog numbers of switches affected by the recall, visit http://www.schneider-electric.us/gdss-safetyalert.

Public Hearing – Marina Ground-Fault Protection Requirements Rule Proposal
The NEC has specified ground-fault protection requirements for marinas in Article 555 since the 2011 edition. Currently, the NEC requires all overcurrent devices supplying the marina to have ground-fault protection set to trip when leakage current to ground (or water) of 30-milliampere (mA) or greater is detected. These requirements were introduced to prevent Electric Shock Drowning (ESD) in and around marinas. For more information about ESD, visit www.electricshockdrowning.org.

The department is accepting written comments and will hold a public hearing regarding proposed changes to WAC 296-46B-555 ground-fault protection for marinas. The current rule, effective until July 1, 2018, amends the ground-fault protection levels specified in NEC 555.3 to allow 100-milliampere (mA) protection for feeders. The proposed rule, requested by the Northwest Marine Trade Association, extends this allowance until September 1, 2019, at which time the ground-fault protection requirements for marinas will be as published in the 2020 NEC.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to:

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
A public hearing will be held May 9, 2018 at 9 a.m. at the Department of L&I building, 7273 Linderson Way SW, Tumwater, WA. You may submit written comments to Alicia Curry, Department of Labor & Industries, PO Box 44000, Olympia, WA 98504-4400; by email to Alicia.Curry@lni.wa.gov; or by fax to 360-902-5292. Written comments must be received by 5 p.m. on May 10, 2018. Visit the Rule Updates page of our website for more information including the proposed rule language and a timeline for rulemaking.

Sign Specialty Contractors and Electricians Cannot Replace Luminaires

The recent rule change to the scope of work for the (04) Sign specialty in WAC 296-46B-920(d) does not allow replacement of existing luminaires. The revised rule language, effective February 23, 2018 states: This specialty may service, maintain, repair, or install retrofit kits within housings of exterior luminaires that are mounted on a pole or other structure with like-in-kind or retrofit kit components. The term “retrofit kit” is defined in Article 100 of the NEC.

NEC 514.13 Maintenance Disconnect – Each Dispenser Must Have a Disconnecting Means

Requirements for emergency electrical disconnects for motor fuel dispensing facilities in NEC 514.11 were discussed in the January 2018 edition of this newsletter. In this edition, we will discuss the requirement for provisions for maintenance and service of dispensing equipment. NEC 514.13 states, Each dispensing device shall be provided with a means to remove all external voltage sources, including power, communications, data, and video circuits and including feedback, during periods of maintenance and service of the dispensing equipment. The location of this means shall be permitted to be other than inside or adjacent to the dispensing device. This means shall be capable of being locked in the open position in accordance with 110.25. This requires a means to remove all potential electrical ignition sources including sources that may backfeed into the dispenser (such as the grounded conductor) from the dispenser being worked on while the remaining dispensers in the facility remain operational. This is typically accomplished by installation of a low voltage dispenser disconnect (LVDD) for each dispenser, allowing each dispenser to be individually isolated from all power sources during periods of maintenance and service.

Equipment grounding and bonding conductors must not be opened by either the emergency or maintenance disconnecting means. Grounding and bonding in Class I locations shall comply with NEC 501.30. The locknut-bushing and double-locknut methods are not approved for bonding purposes, but bonding jumpers with proper fittings or other approved means of bonding shall be used back to the point of service or separately derived system bonding.

Guest Rooms and Suites of Hotels and Motels - Arc Fault Circuit Interrupter (AFCI) Protection

New in 2017 NEC210.12(C), is a requirement that all 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels shall be provided with AFCI protection as described in 210.12(A)(1) through (A)(6). Previous NEC editions only required AFCI protection in guest rooms and guest suites that are provided with permanent provisions for cooking as specified in 210.18 (210.17 in the 2017 edition). The 2017 NEC became effective July 1, 2017 and this requirement applies to all projects where the permit was purchased on or after that date. Be sure to share this requirement with anyone involved in design, construction, or remodeling of wiring in hotels and motels.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. A property owner made this installation and requested an inspection for approval to energize the service. In Washington, a property owner may perform electrical wiring on their own property without limitation and regardless of qualifications. Luckily, this installation was inspected. In addition to the unprotected service conductors inside the building, notice the connection of the grounding electrode conductor and no main bonding jumper.

Answer to Question of the Month: No. WAC 296-46B-705(2) states: In addition to the requirements of NEC 705.31, electric power production source conductors connected to the supply side of the service disconnecting means must be installed using wiring methods specified for service conductors in WAC 296-46B-230(7). This section gives a list of approved wiring methods for installation of service conductors within a building or structure.
Invitation to a Stakeholder Meeting Near You

I am holding 18 electrical stakeholder meetings in various locations across the state between March and May 2018. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. All meetings are 6 – 8 p.m.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Address or Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 4</td>
<td>Tumwater – L&amp;I Auditorium</td>
<td>7273 Linderson Way SW</td>
</tr>
<tr>
<td>April 5</td>
<td>Aberdeen – L&amp;I Building</td>
<td>415 West Wishkah Street, Suite B</td>
</tr>
<tr>
<td>April 11</td>
<td>Tukwila – L&amp;I Building</td>
<td>12806 Gateway Drive South</td>
</tr>
<tr>
<td>April 26</td>
<td>Tacoma – L&amp;I Building</td>
<td>950 Broadway, Orcas Room, 5th floor</td>
</tr>
<tr>
<td>May 9</td>
<td>Silverdale – L&amp;I Building</td>
<td>10049 Kitsap Mall Boulevard NW Suite 100</td>
</tr>
<tr>
<td>May 10</td>
<td>Sequim – Clallam PUD #1, 104</td>
<td>Hooker Road, West of Sequim off Hwy 101, Lake Crescent Board Room</td>
</tr>
<tr>
<td>May 22</td>
<td>Everett – Snohomish County PUD</td>
<td>Commission Meeting Room 2320 California Street</td>
</tr>
<tr>
<td>May 23</td>
<td>Mount Vernon –</td>
<td>Northwestern Washington Research and Extension Center 16650 State Route 536</td>
</tr>
<tr>
<td>May 29</td>
<td>Vancouver – Clark PUD – Electric Center Community Room, 1200 Fort Vancouver Way</td>
<td></td>
</tr>
<tr>
<td>May 30</td>
<td>White Salmon – White Salmon</td>
<td>Valley Community Library – 77 NE Wauna Avenue</td>
</tr>
<tr>
<td>May 31</td>
<td>Longview –</td>
<td>Lower Columbia College 1600 Maple, Health &amp; Science Building, HSB-101, Laufman Lecture Hall</td>
</tr>
</tbody>
</table>

Electrician Examination Questions Update to 2017 Codes Set for July 1, 2018

The department and our examination contractor, PSI have set a goal of having all electrician examination questions updated to the 2017 National Electrical Code® (NEC®), Washington Administrative Code (WAC), and Revised Code of Washington (RCW) by July 1, 2018. After that date, all exams will be based on the 2017 codes even if a person must retake an exam that was previously failed using the 2014 version. Typically, exam questions do not change significantly with adoption of new versions of the code.

All examinations are open-book and exam candidates are allowed to take any original copyrighted material into the exam with them. Copies are not allowed except copies of RCW 19.28 or WAC 296-46B may be used. For more information about the exams, you can refer to WAC 296-46B-960 or visit the Electrical Exam Information page of our website.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
Legislative Update

Two bills affecting the electrical program have passed the legislature and are awaiting the Governor’s signature. You can get information about each bill by clicking on the hyperlinked bill numbers below.

1. **Engrossed Substitute House Bill 1952** – Allows cities that have electrical inspection jurisdictions to enforce licensing and certification provisions of RCW 19.28. Allows cities to establish penalties and adjudicate matters of compliance. Penalties upheld through an appellate process of a city or town may be appealed to the electrical board. The city or town that is party to the matter must reimburse all costs of an appeal payable from the electrical license fund. Does not diminish the department’s enforcement authority within cities.

2. **Substitute Senate Bill 6126** – Effective July 1, 2023, requires completion of an apprenticeship to qualify for journey-level electrician certificate of competency examination. This means an applicant must complete their current 8000 hour experience requirement along with 96 hours of classroom training, apply for, and be approved for examination by July 1, 2023 to qualify for the journey-level examination. After that date, all journey-level applicants must have completed an approved apprenticeship. The bill does not affect qualification for specialty electrical certificates. For more information about apprenticeships including how to receive credit for previous experience and what this means for employers, visit the [Apprenticeship](#) page of our website.

Correction Reduction Initiative

In June 2006, the electrical program introduced a special project, the “Correction Reduction Initiative”. The goal is for selected contractors to reduce their corrections by 15% in one year. At the beginning of each fiscal year, the department identifies contractors who received more than twice the average number of corrections for contractors with at least 24 inspections in the previous year. Each month, the contractors receive a list of all of their corrections from the previous month. This gives them an opportunity to review the items with their electricians to improve the quality of their work.

This initiative has proven to be very successful in helping contractors reduce corrections and save money for themselves and the department. So far this fiscal year (since July 1, 2017), the contractors in the Correction Reduction Initiative have reduced their corrections by an average of 26 percent. The result is safer electrical installations at a significant cost savings to the contractor, customers, and the department. Corrections cost everyone by causing return visits to the jobsite. Our studies have shown that 20 percent of contractors receive 80 percent of corrections.

We use this initiative to improve our own performance as inspectors as well. Contractors who believe they have received improper corrections should contact the electrical inspection field supervisor for the issuing office to discuss possible invalid corrections, such as those that are not within the scope of the contractor’s work, or those that are not supported by a correct code reference. A contractor should never accept invalid corrections because they fear reprisal from an inspector or supervisor. Our inspectors are required to provide an accurate reference (NEC, WAC) for all corrections issued. Improper corrections should contact the electrical inspection field supervisor for the issuing office to discuss possible invalid corrections.

Rulemaking Updates – Marina Ground-Fault Protection Requirements

The department is considering changes to [WAC 296-46B-555](http://www.electricalprogram.lni.wa.gov/) regarding ground-fault protection requirements for Marinas. The current rule, effective July 1, 2017, amends the ground-fault protection levels specified in NEC 555.3 to allow 100 milliampere protection for feeders until July 1, 2018. The department is considering a request from the Northwest Marine Trade Association to extend this allowance beyond July 1, 2018. Watch the Rule Development page of our website for more information including the proposed rule language and a timeline for rulemaking. The NEC has specified ground-fault protection requirements in Article 555 since the 2011 edition. These requirements were introduced to prevent Electric Shock Drowning (ESD) in and around marinas. For more information about ESD, visit [www.electricshockdrowning.org](http://www.electricshockdrowning.org).

Ugly Picture: If viewing this document online, click on the picture to open a larger image.

Pictured is an electric wall heater insert that had been operating flawlessly for about 10 years until the property owner noticed fire coming from the grill and called an electrician. Electric wall heaters collect lint and dust that must be cleaned at least every year at the beginning of the heating season. Follow the manufacturer’s instructions for regular cleaning or risk disaster.

**Answer to Question of the Month:** 14 AWG – NEC 240.4(G), 440.35; Table 310.15(B)(16); Nameplate minimum circuit ampacity – 19.4

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: [http://www.ElectricalCurrents.lni.wa.gov](http://www.ElectricalCurrents.lni.wa.gov)


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 & Industries is an Equal Opportunity employer.
Question of the Month – What is the maximum output circuit current rating of an interconnected electric power source(s) connected to a circuit breaker located at the opposite end of a panelboard busbar from the 175 ampere main breaker protecting the busbar. The ampacity rating of the busbar is 200 amperes. The busbar is sized for the loads connected in accordance with NEC Article 220, but the sum of the ampere ratings of the load circuit breakers exceed the rating of the busbar. See correct answer on Page 2.

Invitation to a Stakeholder Meeting Near You
I am holding 18 electrical stakeholder meetings in various locations across the state between March and May 2018. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business.

<table>
<thead>
<tr>
<th>2018 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 6 – Pullman – Gladish Community and Cultural Center, Oscars Room, 115 NW State St.</td>
</tr>
<tr>
<td>March 7 – Spokane – Spokane Falls Community College, 3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges A &amp; B</td>
</tr>
<tr>
<td>March 12 – Pateros – Howard’s on the River Event Center, 233 Lakeshore Dr.</td>
</tr>
<tr>
<td>March 13 – East Wenatchee – Douglas County PUD, 1151 Valley Mall Parkway</td>
</tr>
<tr>
<td>March 14 – Ellensburg – Red Lion Hotel &amp; Conference Center – 1700 Canyon Road</td>
</tr>
<tr>
<td>March 28 – Kennewick – Benton PUD Auditorium – 2721 West 10th Avenue</td>
</tr>
<tr>
<td>March 29 – Moses Lake – L&amp;I Building 3001 West Broadway Avenue</td>
</tr>
<tr>
<td>April 4 – Tumwater – L&amp;I Auditorium – 7273 Linderson Way SW</td>
</tr>
<tr>
<td>April 5 – Aberdeen – L&amp;I Building 415 West Wishkah Street, Suite B</td>
</tr>
<tr>
<td>April 11 – Tukwila – L&amp;I Building 12806 Gateway Drive South</td>
</tr>
<tr>
<td>April 26 – Tacoma – L&amp;I Building 950 Broadway, Orcas Room, 5th floor</td>
</tr>
<tr>
<td>May 9 – Silverdale – L&amp;I Building – 10049 Kitsap Mall Boulevard NW Suite 100</td>
</tr>
<tr>
<td>May 10 – Sequim – Location yet to be determined</td>
</tr>
<tr>
<td>May 22 – Everett – Snohomish County PUD Commission Meeting Room 2320 California Street</td>
</tr>
<tr>
<td>May 23 – Mount Vernon – Northwestern Washington Research and Extension Center 16650 State Route 536</td>
</tr>
<tr>
<td>May 29 – Vancouver – Clark PUD – Electric Center Community Room, 1200 Fort Vancouver Way</td>
</tr>
<tr>
<td>May 30 – White Salmon – White Salmon Valley Community Library – 77 NE Wauna Avenue</td>
</tr>
<tr>
<td>May 31 – Longview – Lower Columbia College 1600 Maple, Health &amp; Science Building, HSB-101, Kaufman Lecture Hall</td>
</tr>
</tbody>
</table>

Legislative Update
The bills listed below are still under consideration by the legislature. You can get information about each bill by clicking on the hyperlinked bill numbers below. Review the bills and comment if you desire. A comment button is located to the right of the bill number on each webpage. You may also contact your legislator to share your opinion about any legislation by visiting the legislative website at: [http://www.leg.wa.gov/LIC/Pages/hotline.aspx](http://www.leg.wa.gov/LIC/Pages/hotline.aspx).

1. **Engrossed Substitute House Bill 1952** – Allows cities that have electrical inspection jurisdictions to enforce licensing and certification provisions of RCW 19.28. Changes city seat on the electrical board to a voting position. Allows cities to establish penalties and adjudicate matters of compliance. Does not diminish the department’s enforcement authority within cities. Passed the House and is currently on second reading in Senate.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: [http://www.ElectricalCurrents.Lni.wa.gov](http://www.ElectricalCurrents.Lni.wa.gov)

2. **Substitute Senate Bill 6126** – Requires completion of an apprenticeship to receive a journey level electrician certificate of competency. This bill would become effective July 1, 2023. Passed the Senate on January 25.

**Serious Electrical Installation Corrections**

At the January 25, 2018 meeting of the Electrical Board, the department presented the board with information they requested regarding serious electrical installation corrections issued by the department’s electrical inspectors. The Mobile Inspection Program used by inspectors contains over 5,000 code violations. About half of those are considered serious, and if not corrected would result in compliance action and/or disconnection of power. As you can see in the charts below, the vast majority of inspections are for licensed electrical contractors, but almost four times as many serious corrections per permit are issued to property owners. Having said that, a licensed electrical contractor employing certified electricians should not be receiving any serious electrical code violations. In next month’s edition, I will discuss the correction reduction initiative the department has had in place for many years. This initiative has proven to be very effective and currently, the contractors in the initiative pool have reduced their corrections per inspection by almost 26 percent compared to last year.

<table>
<thead>
<tr>
<th>Serious Correction Data - Fiscal Year 2017 - July 1, 2016 through June 30, 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Inspections</strong></td>
</tr>
<tr>
<td>137,464</td>
</tr>
<tr>
<td>4,805</td>
</tr>
<tr>
<td>20,977</td>
</tr>
<tr>
<td>1,75</td>
</tr>
</tbody>
</table>

**Rulemaking Updates**

**Residential and Sign Specialty Work Scopes** – As published in previous editions, changes to WAC 296-46B-920(2)(a) and (2)(d) regarding the scopes of work for the residential and sign specialties became effective February 23, 2017. For complete details and to view the rulemaking documents, visit the Rule Development page of our website.

**Marina Ground-Fault Protection Requirements** – The department is considering changes to WAC 296-46B-555 regarding ground-fault protection requirements for Marinas. The current rule, adopted July 1, 2017, amends the ground-fault protection levels specified in NEC 555.3 to allow 100 milliampere protection for feeders until July 1, 2018. The department is considering a request from the Northwest Marine Trade Association to extend this allowance beyond July 1, 2018. Watch the Rule Development page of our website for more information including the proposed rule language and a timeline for rulemaking. The NEC has specified ground-fault protection requirements in Article 555 since the 2011 edition. These requirements were introduced to prevent Electric Shock Drowning (ESD) in and around marinas. For more information about ESD, visit [www.electricshockdrowning.org](http://www.electricshockdrowning.org).

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. An electrician experienced in hazardous location wiring methods will immediately see the problem with this installation. This seal-off was poured, which created an additional problem for the installer, or the person who had to re-do the work. Do not throw away the instruction sheet provided with electrical equipment – read it!

**Answer to Question of the Month:** 52 Amperes. NEC 705.12(B)(2)(3)(b). The sum of 125 percent of the power source(s) output circuit current and the rating of the overcurrent device protecting the busbar shall not exceed 120 percent of the ampacity of the busbar. 200 ampere busbar X 120% = 240 amperes. 240 − 175 ampere main breaker = 65 amperes. 65 ÷ 125% = 52 amperes.
Question of the Month – How long after receiving a correction notice from an electrical inspector does a permit holder have to correct a non-compliant installation. See correct answer on Page 2.

Invitation to a Stakeholder Meeting Near You
I am holding 18 electrical stakeholder meetings in various locations across the state between March and May, 2018. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations listed below. Meeting dates and addresses will also be posted on our Electrical Calendar webpage and distributed on the program email list. If you are not on the email list, you may join at our Electrical Email List webpage.

<table>
<thead>
<tr>
<th>2018 Stakeholder Meetings 6 – 8 p.m.</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 6 – Pullman – Gladish Community and Cultural Center, Oscars Room, 115 NW State St.</td>
</tr>
<tr>
<td>March 7 – Spokane – Spokane Falls Community College, 3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges A &amp; B</td>
</tr>
<tr>
<td>March 12 – Pateros – Howard’s on the River Event Center, 233 Lakeshore Dr.</td>
</tr>
<tr>
<td>March 13 – East Wenatchee – Douglas County PUD, 1151 Valley Mall Parkway</td>
</tr>
<tr>
<td>March 14 – Ellensburg – Location yet to be determined</td>
</tr>
<tr>
<td>March 28 – Kennewick – Benton PUD Auditorium – 2721 West 10th Avenue</td>
</tr>
<tr>
<td>March 29 – Moses Lake – L&amp;I Building 3001 West Broadway Avenue</td>
</tr>
<tr>
<td>April 4 – Tumwater – L&amp;I Auditorium – 7273 Linderson Way SW</td>
</tr>
<tr>
<td>April 5 – Aberdeen – L&amp;I Building 415 West Wishkah Street, Suite B</td>
</tr>
<tr>
<td>April 11 – Tukwila – L&amp;I Building 12806 Gateway Drive South</td>
</tr>
<tr>
<td>April 26 – Tacoma – L&amp;I Building 950 Broadway, Orcas Room, 5th floor</td>
</tr>
<tr>
<td>May 9 – Silverdale – L&amp;I Building – 10049 Kitsap Mall Boulevard NW Suite 100</td>
</tr>
<tr>
<td>May 10 – Sequim – Location yet to be determined</td>
</tr>
<tr>
<td>May 22 – Everett – Snohomish County PUD Commission Meeting Room 2320 California Street</td>
</tr>
<tr>
<td>May 23 – Mount Vernon – Northwestern Washington Research and Extension Center, 16650 State Route 536</td>
</tr>
<tr>
<td>May 29 – Vancouver – Clark PUD – Electric Center Community Room, 1200 Fort Vancouver Way</td>
</tr>
<tr>
<td>May 30 – White Salmon – White Salmon Valley Community Library – 77 NE Wauna Avenue</td>
</tr>
<tr>
<td>May 31 – Longview – Lower Columbia College 1600 Maple, Health &amp; Science Building, HSB-101, Kaufman Lecture Hall</td>
</tr>
</tbody>
</table>

Legislative Update
If you are a part of the electrical or telecommunications industries regulated by L&I, lawmakers are considering several bills that may affect you. None of this legislation is sponsored by L&I.

The bills listed below are available for consideration by the legislature. To remain available for consideration, bills must pass out of their committees by February 2 and out of their house of origin by February 14. You can get information about each bill by clicking on the hyperlinked bill numbers below. Review the bills and comment if you desire. A comment button is located to the right of the bill number on each webpage. You may also contact your legislator to share your opinion about any legislation by visiting the legislative website at: http://www.leg.wa.gov/LIC/Pages/hotline.aspx.
1. **House Bill 1430, Senate Bill 5304** – Requires the department of L&I to adopt the non-administrative portion of the electrical rules through a process in which the department, the Washington cities electrical committee, and the technical advisory committee have an equal vote in the adoption of the rules.

2. **Substitute Senate Bill 5211** – Removes the ability of the Electrical Board to hear appeals of decisions by the Office of Administrative Hearings. Decisions made by an administrative law judge would be a final order.

3. **House Bill 1855** – Requires business name and electrical contractor license number to be marked on vehicles while used in the electrical construction trade.

4. **House Bill 1871** – Effective January 1, 2022, requires electrical or plumbing certification for employees of state agencies while performing electrical or plumbing work on the premises of a state agency employer.

5. **Engrossed Substitute House Bill 1952** – Allows cities that have electrical inspection jurisdictions to enforce licensing and certification provisions of RCW 19.28. Changes city seat on the electrical board to a voting position. Allows cities to establish penalties and adjudicate matters of compliance. Does not diminish the department’s enforcement authority within cities. Passed the House and referred to Senate Committee on Labor & Commerce.

6. **Substitute Senate Bill 6126** – Requires completion of an apprenticeship to receive a journey level electrician certificate of competency. This bill would become effective July 1, 2023. Passed the Senate on January 25.

7. **House Bill 2123, Senate Bill 5860** – Allows credit toward qualifying for a specialty certificate of competency for work experience not in the electrical construction trade. Also provides a grandfathering opportunity for certain specialty certificates of competency to individuals who can show they were employed in those specialties prior to January 1, 2002.

**Department Adopts Rule Amendments for 02 Residential and 04 Sign Specialty Scopes of Work**
The Department is adopting modifications to the electrical licensing scopes of work in **WAC 296-46B-920(2)(a)** for the (02) residential specialty and **WAC 296-46B-920(2)(d)** for the (04) Sign specialty. You can find the rulemaking documents on the **Rule Development** page of our website.

Effective February 23, 2018, this rule revision will:
- Allow (02) residential specialty electrical contractors and electricians to work in multi-family dwellings of types III, IV, or V construction when there are not more than six stories of multifamily dwellings of types III, IV, or V construction above grade or above types I or II construction. Under current rule, the (02) residential specialty is limited to installation of non-metallic sheathed cable in multifamily dwellings not exceeding three stories above grade. The adopted rule aligns the scope of work for this specialty with building code requirements for the installation of non-metallic sheathed cable. Building codes restrict the building construction types where non-metallic sheathed cable can be used to a maximum of six stories. The building code allows a maximum of six stories to be built above grade or above types of construction where non-metallic sheathed cable is not allowed, commonly referred to as pedestal construction (types III, IV, or V construction above types I or II construction); and
- Allow (04) sign specialty electrical contractors and electricians to retrofit existing luminaires that are mounted on a pole or other structure with energy efficient technology, such as LEDs. Under the existing rule, the (04) sign specialty can service, maintain, or repair these luminaires with like-in-kind components but the current rule prohibits alterations such as LED retrofits. These will now be allowed under the (04) sign specialty.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. Steel pipe electrodes shall have the outer surface galvanized or otherwise metal-coated for corrosion. A single pipe electrode shall be supplemented as required by NEC 250.53(A)(2) when an existing electrical service is altered.

**Answer to Question of the Month:** Fifteen calendar days - RCW 19.28.101, WAC 296-46B-901(15). Outstanding corrections subject the permit holder to monetary penalties and disconnection of power.
Question of the Month – Thank you to everyone who responded to last month’s question. The code question of the month first appeared in the September 2000 edition of the Electrical Currents, which asked: What is the minimum length that the conductors in a single gang light switch box must extend outside the box opening? Answer: 3 inches per NEC® 300.14. Congratulations to the first five correct responders who were awarded LED headlamps.

This month’s question: Which of the following conductors are subject to the requirements for Rapid Shutdown of Solar Photovoltaic Systems in NEC® 690.12? (Select all that apply) A) Photovoltaic Output Circuit, B) Inverter Input Circuit, C) Inverter Output Circuit, D) Photovoltaic Source Circuit. See correct answer(s) on Page 2.

Reminder: Public Hearing on Proposed Rule Amendments
As reported in last month’s newsletter, a public hearing regarding the proposed rule amendments to the scopes of work for the (02) Residential and (04) Sign specialties will be held at the L&I building, 7273 Linderson Way, Tumwater, WA at 9 a.m. on January 3, 2017. Please visit the Rule Development page of our website for more information and for instructions for sending written comments.

ECORE Team is Busy Keeping Washington Safe and Working
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 electricians who take pride in their work and the electrical industry. Work done by these unlicensed contractors and uncertified individuals usually results in installations that are a hazard to life and property and leave the unprotected consumer with little recourse.

The Electrical Compliance, Outreach, Regulation, and Education (ECORE) team has been busy finding violators and issuing citations to these unlicensed contractors and uncertified electricians. For the first three months of this fiscal year, July through September 2017, the team issued 1,563 citations for the focused underground economy violations of unlicensed electrical contracting, uncertified electricians or failing to supervise trainees, and failing to obtain electrical permits. Many of these citations involve multiple locations statewide at national chain stores using out-of-state unlicensed contractors and workers. These investigations are very time-consuming but usually result in electrical work being taken over by licensed electrical contractors with the installations being permitted and inspected. Penalties issued to two companies in a recent incident involving 130 jobsites statewide totaled over $500,000 due to the penalties being issued at the 2nd and 3rd offense amounts, which means these companies had been caught and cited previously for the same violations.

If you would like to join us in combatting the underground economy, you can make a big difference by watching for and reporting illegal electrical activity. For more information you can visit our Report Electrical Law Violations webpage. You may report suspected violations by contacting your nearest local inspection office, or one of the ECORE team members:

- Northwest Washington: Rand Jones, 360-416-3034 (office) or 360-561-0440 (cell).
- North Central Washington: Rand Jones, 360-416-3034 (office) or 360-561-0440 (cell).
- King County: Sergey Zinakov, 206-835-1130 (office) or 206-406-5543 (cell).
- Southwest Washington: Darin Lyon, 253-596-3907 (office) or 360-471-0746 (cell).
- Eastern Washington: Phil Jordan, 509-324-2542 (office) or 360-471-0691 (cell).
- South Central Washington – Yakima/Tri Cities: Jeffrey Robertson, 509-454-3769 (office) or 509-263-3583 (cell).

Safety Tip of the Month
Before removing any fuse from a circuit, be sure the equipment is in an electrically safe work condition.
When removing fuses, use an approved fuse puller and break contact on the line 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.
Electrician Examination Questions Update to 2017 Codes Set for July 1, 2018

The department and our examination contractor, PSI have set a goal of having all electrician examination questions updated to the 2017 National Electrical Code® (NEC®), Washington Administrative Code (WAC), and Revised Code of Washington (RCW) by July 1, 2018. After that date, all exams will be based on the 2017 codes even if a person must retake an exam that was previously failed using the previous 2014 version. Typically, exam questions do not change significantly with adoption of new versions of the code.

All examinations are open-book and exam candidates are allowed to take any original copyrighted material into the exam with them. Copies are not allowed except copies of RCW 19.28 or WAC 296-46B may be used. For more information about the exams, you can refer to WAC 296-46B-960 or visit the Electrical Exam Information page of our website.

**NEC® 514.11 Motor Fuel Dispenser Emergency Electrical Disconnects**

2017 NEC® 514.11 was revised to align with requirements in NFPA 30A (Code for Motor Fuel Dispensing Facilities and Repair Garages) and to clarify what is required for emergency shutoff devices or electrical disconnects at all motor fuel dispensing facilities including attended and unattended self-service fuel dispensing facilities. Motor fuel dispensing systems must be provided with one or more clearly identified emergency shutoff devices or electrical disconnects installed in approved locations not less than 20 feet or more than 100 feet from the fuel dispensing devices they serve. These measurements now apply to all fuel dispensing systems including both attended and unattended self-service fuel dispensing facilities. WAC 296-46B-514(6) requires the emergency shutoff to be labeled as such with an identification plate (see WAC 296-46B-100 definition of “identification plate”) that is substantially red in color with letters at least 1 inch high.

The emergency shutoff device(s) must disconnect power to all dispensing devices; to all remote pumps serving the dispensing devices; to all associated power, control, and signal circuits; and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. The requirement to disconnect all associated power, communications, data, and video circuits was added in the 2011 NEC®. Prior to that, only the nominal voltage circuit was required to be disconnected. Also, WAC 296-46B-514(3) requires the simultaneous disconnection of the grounded conductor(s). In a large fueling facility such as a truck stop, design of the dispensers and the distance limitations may require multiple emergency shutoff devices. When more than one emergency shutoff device is provided, all devices must be interconnected. Resetting from an emergency shutoff condition cannot be automatic, but must require manual intervention. Intrinsically safe electrical equipment (See NEC® 504 Intrinsically Safe Systems) need not meet the requirement for emergency shutoff.

For attended self-service facilities, NEC® 514.11(B) and WAC 296-46B-514(6)(b) requires the emergency shutoff to be readily accessible to the attendant and be located outdoors and within sight of the pump or dispensing equipment it controls. For unattended self-service facilities, NEC® 514.11(C) and WAC 296-46B-514(6)(c) requires the emergency shutoff to be readily accessible to the patron and within sight of the pump or dispensing equipment it controls.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. One of our inspectors was at a residence inspecting a new air conditioner unit. When he asked to see the electrical panel where the circuit originated, the homeowner got very nervous and the inspector discovered this very dangerous installation to a generator transfer panel. The inspector followed up using the department’s process to ensure a permit was purchased and repairs were made.

**Answer to Question of the Month:** A), B), C), and D).

NEC® 690.12. Rapid Shutdown requirements for controlled conductors outside the array boundary on or in buildings apply to all PV circuits supplied by the PV system per 690.12(A). “PV circuits” include all DC and AC circuit conductors supplied by the PV system. Beginning January 1, 2019, rapid shutdown requirements will be expanded to include controlled conductors located inside the array boundary. Rapid Shutdown requirements were put in place to protect fire fighters from shock hazard when fighting fires on or in buildings having PV systems.
Question of the Month – When did the “Code Question of the Month” feature first appear in the Electrical Currents newsletter, and what was the question? Hint – you can download two searchable PDF documents of recent and archived Electrical Currents newsletters on the Electrical Currents Newsletter page of our website. Try it! Download the archived file and use the PDF search function (Edit > Advanced Search; or Shift + Ctrl + F) and search for “code question of the month”. When you find the correct two-part answer to this month’s question, email it to ElectricalProgram@lni.wa.gov. Use “Electrical Currents” in the email subject line. First five correct responses will receive a prize (give us your name and mailing address). Now you will be able to search for any subject of past newsletters and be able to contact the Electrical Program! Sorry, but L&I employees are not eligible for the prize, but are encouraged to respond (we already know how to do this). We will publish the correct answer in next month’s newsletter.

Twenty Years of Electrical Currents Newsletters
This edition of the Electrical Currents completes twenty years of monthly publication. Chief Electrical Inspector Janet Lewis first published the Electrical Currents newsletter in January 1998 to provide code guidance and to promote installation and inspection consistency statewide. Prior to the “Electrical Currents”, the department used newsletters for years as a valuable source of important information relevant to electrical contractors and individuals doing electrical work in the State of Washington. Here is an excerpt from the first article in the first Electrical Currents newsletter in January 1998: “In response to requests from electricians, electrical contractors, engineers, and our own electrical inspectors we have initiated "ELECTRICAL CURRENTS" as a forum for the code interpretations that are requested from the Chief Electrical Inspector. We hope that the publication of this information will result in fewer electrical corrections and improve consistency in the enforcement of the NEC and Electrical Installation Laws of Washington.”

Frequently, we receive questions regarding interpretation of codes and rules. Legislative change in 1997, made the Chief Electrical Inspector, subject to the review of the Director of the Department of Labor & Industries, responsible for providing the final interpretation of adopted state electrical standards, rules, and policies for the department and its inspectors. Prior to the 1997 change, the Electrical Board made those types of final determinations. We use the Electrical Currents newsletter to inform subscribers of potential code concerns, interpretations, and rulemaking activity. All previous editions are available on the Electrical Currents page of our website in searchable PDF format. Thank you to everyone who replied with questions or commented on articles over the years. It helps us improve and the feedback lets us know if we are going in the right direction. Encourage others to get involved by joining the Electrical E-mail List.

Public Hearing Regarding Proposed Changes to Sign and Residential Specialty Scopes of Work
The department will hold a public hearing to receive information and comments for proposed amendments to WAC 296-46B-920(2)(a) and (2)(d) scopes of work for residential and sign specialties. As discussed in last month’s newsletter, the proposed rule, in response to petitions from stakeholders, would amend the work scopes to allow additional work to be performed by these specialties. For complete details and proposed rule language, visit the Rule Development page of our website. The public hearing will be held January 3, 2018 at 9 a.m. at the L&I headquarters building, 7273 Linderson Way SW, Room S119, Tumwater, WA.

Safety Tip of the Month
Portable generators are useful during power outages and on construction sites. Be aware of the dangers of improper use of portable generators. One of the most common dangers associated with portable generators is carbon monoxide poisoning.

Make sure your generator is in a well-ventilated outdoor area. Never use a generator in an attached garage, even with the door open.

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

You can download a helpful generator safety publication from the National Fire Protection Association here.

There are six options listed in NEC 210.12(A)(1)-(A)(6) for providing AFCI protection for new branch circuits in dwelling units. By far, the most common method of protection is using a combination-type AFCI circuit breaker installed in the panel at the source of the branch-circuit as described in (A)(1). There is confusion about the applicability of the remaining options, especially regarding use of outlet branch-circuit devices (AFCI receptacles).

In general, for new branch-circuits that require AFCI protection, an AFCI receptacle may only be used when supplemented by the additional methods of protection described in 210.12(A)(2), (5), or (6). The methods described in (A)(3) and (A)(4) are not available for use due to lack of availability of equipment to provide this protection. (A)(3) describes a “supplemental arc protection circuit breaker” installed at the origin of the branch circuit. This is not a normal circuit breaker. It is a special type of breaker that is not currently available on the market. (A)(4)(d) describes a circuit breaker and an AFCI receptacle that are “identified as meeting the requirements for a system combination-type AFCI and shall be listed as such”. Currently, no devices are available that carry this identification and listing, so (A)(4) is not available.

That leaves 210.12(A)(2), (5), or (6) as the only options for using AFCI receptacles for protection of a new branch circuit.

- **210.12(A)(2)** A listed “branch/feeder-type AFCI” installed at the origin of the branch-circuit in combination with an AFCI receptacle installed at the first outlet of the branch circuit. This option causes the most confusion because many electricians forget to read the first part of the sentence. A listed branch/feeder type AFCI is the old style of AFCI circuit breaker commonly used before the “combination-type” circuit breakers were required in the 2005 NEC. It is not likely these branch/feeder type circuit breakers are available unless a contractor has some old ones in their stock, so this option is probably not available.

- **210.12(A)(5)** An AFCI receptacle may be installed at the first outlet of a branch circuit only if the portion of the circuit from the panel to the first outlet is installed in rigid metal conduit (RMC), intermediate metal conduit (IMC), electrical metallic tubing (EMT), type MC cable, steel-armored type AC cable meeting the requirements of 250.118, metal wireways, metal auxiliary gutters, and metal outlet and junction boxes.

- **210.12(A)(6)** An AFCI receptacle may be installed at the first outlet of a branch circuit only if the portion of the circuit from the panel to the first outlet is installed in metal or nonmetallic conduit or tubing, or type MC cable encased in not less than 2 inches of concrete.

As you can see, of the three options listed above, only two, (A)(5) and (A)(6) are likely to be available and they are probably much more costly than using a combination-type AFCI circuit breaker. If installing a new circuit from an older panel where a combination-type AFCI circuit breaker is not available, 210.12(A)(5) (i.e., use of metal raceway or cable) is probably the only viable option, as encasing a raceway in 2 inches of concrete may not be practicable.

The requirements in 210.12(D) for branch circuit extensions or modifications however, are not as restrictive and allow installation of an AFCI receptacle at the first receptacle outlet of an existing branch circuit where existing wiring is modified, replaced, or extended.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. This is the fusible disconnect for an elevator cab lighting circuit. Notice the grounded circuit conductor (neutral) connected to the load side of a fuse. This is a violation of NEC 240.22 and could create a shock hazard if the fuse in the grounded circuit conductor blows and the ungrounded conductor remains energized. An overcurrent device in the grounded circuit conductor is only allowed if it opens all conductors of the circuit including the grounded conductor and is designed so that no pole can operate independently.
Question of the Month – When is a disconnecting means not required within sight of the indoor unit of a split-system heating, ventilation, air-conditioning, and refrigeration (HVAC/R) system? See correct answer on Page 2.

Plan Ahead – No Electrical Inspections on November 14 and 15
The department will be holding a two day training for all L&I inspectors. We regret the inconvenience this causes, but we have found that a statewide approach improves consistency and is the most efficient use of our training budget. Please let your customers know and plan for your inspections accordingly.

Proposed Changes to Sign and Residential Specialty Scopes of Work
The department has received two petitions from stakeholders to modify the (04) Sign and (02) Residential specialty workscopes. The (04) Sign specialty petition seeks to include energy efficient retrofitting of exterior luminaires that are mounted on a pole or other structure. Current language allows the sign specialty to service, maintain, or repair these luminaires with like-in-kind components, which prohibits modifications such as LED retrofits. The (02) Residential specialty petition seeks to allow residential specialty contractors and electricians to perform wiring in multi-family residential buildings based on the type of construction and the allowance in the NEC® for non-metallic sheathed cable in multi-family buildings. Currently, residential specialty electricians are limited to multi-family buildings not exceeding three stories above grade.

The formal rulemaking process is underway to consider input from all stakeholders regarding these issues. A draft of the proposed rule language is posted on the Rule Development page of our website. A special stakeholder meeting was held September 26 in Tacoma, and the proposal was presented to the Electrical Board at their October 26 meeting in Spokane. The board recommended the department proceed with adoption of the proposed language changes. The next step will be filing of the CR-102 document (tentatively scheduled for November 21, 2017) which will give stakeholders instructions about how to provide comments and announce a public hearing, scheduled for January 3, 2018 in Tumwater, WA.

For the latest developments on this and other rulemaking, watch for future announcements in this newsletter and the Rule Development page.

Electricians and Arc-Flash – Working on Energized Service Drops
Question: Is an electrician permitted to disconnect and/or reconnect a secondary service drop on the utility’s side of the meter? The short answer is no - only individuals who meet the training and experience requirements in WAC 296-45, Electric Power Generation, Transmission, and Distribution, are considered to be “qualified electrical employees” and able to work on or with exposed energized lines or parts of equipment operating at 50 volts or more.

The training that qualified electrical employees must have according to WAC 296-45 will include training necessary to work on energized primary and secondary conductors that are not typically protected by overcurrent devices. This qualifies the employee to take a clearance (i.e., receive authorization to work) on the lines or equipment to control the energy source when necessary. The training that Washington certified electricians receive may not be focused towards working on energized lines and equipment, except for testing and certain conditions where it is infeasible to de-energize.

L&I’s Division of Occupational Safety and Health (DOSH) regulates workplace safety rules. Information on electrical safety-related work practices can be found in the General Safety and Health Standards, WAC 296-24-965 and NFPA 70E. These

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/
practices will give guidance to employers on allowing qualified electricians to work on energized utilization systems under limited circumstances. Work practices found in WAC 296-45-065 are applicable to work performed on the utility side of the metered demarcation line. You can download an informational bulletin regarding Electricians and Arc-Flash on the DOSH website at this link. If you would like more information, contact Jeff Krausse, the DOSH Telecommunications and High Voltage Supervisor at (509) 764-6908 or krau235@lni.wa.gov.

The Work of Licensed Electrical Contractors Should be Free of Code Violations

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 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 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 every installation to be without significant safety problems – no corrections. Last year, over 220,000 inspections were made and only 19% of those had corrections written. Typically, only 20% of all electrical contractors caused 80% of all reinspections. Because the contractor failed to be responsible for the quality of their electricians’ work, 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.

When Must a Trainee Submit Experience Hours to the Department?

If not registered in a department-approved apprenticeship, affidavits of experience are eligible for consideration if received by the department no more than 180 days from the expiration date of the associated training certificate. The expiration date closest to the period claimed on the affidavit is the date used to determine eligibility.

Time is not your friend when it comes to justifying hours and types of experience – employers go out of business, supervising electricians and administrators move on. Too often, trainees end up with no one to vouch for their experience or records to support it. The law addresses this problem. RCW 19.28.161(2) requires training certificates to be renewed every two years. At the time of renewal, the holder of a training certificate is required by law to provide the department with an accurate list of the holder’s employers for the previous two-year period and the number of hours worked for each employer. Affidavit forms are available at: http://www.lni.wa.gov/FormPub/default.asp.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. The aluminum meter ring in this picture was found inside a service panel that had been energized for approximately 20 years. If you look closely, the ring has been burned in two places where it contacted the enclosure cover and the back corner (see red circles). When opening any enclosure with energized wiring or parts inside, use extreme caution! Oh, and don’t do something like this!

Answer to Question of the Month: WAC 296-468-440; In one and two-family dwelling units, a disconnecting means is required for the indoor unit(s) of a split system HVAC/R system, unless the outside unit’s disconnecting means is lockable, disconnects the indoor unit, and an indoor disconnecting means is not required by the manufacturer. This is an amendment to the general rule of NEC 440.14 which requires a disconnecting means within sight from and readily accessible from the air-conditioning and refrigerating equipment.
**Question of the Month** – The nameplate on an electric furnace is required to be marked with the minimum supply circuit conductor ampacity and the maximum rating of the branch-circuit short-circuit and ground-fault protective device. What are the most correct code references requiring branch-circuit conductors, and overcurrent protective devices for this equipment to be as stated on the nameplate? Hint – It is not National Electrical Code® (NEC®) 110.3(B). See correct answer on Page 2.

**Plan Ahead – No Electrical Inspections on November 14 and 15**

The department will be holding a two-day training for all L&I inspectors. We regret the inconvenience this causes, but we have found that a statewide approach improves consistency and is the most efficient use of our training budget. Please let your customers know and plan for your inspections accordingly.

**Proposed Changes to Sign and Residential Specialty Scopes of Work**

The department has received two petitions from stakeholders to modify the (04) Sign and (02) Residential specialty workscopes. The (04) Sign specialty petition seeks to include energy efficient retrofitting of exterior luminaires that are mounted on a pole or other structure. Current language allows the sign specialty to service, maintain, or repair these luminaires with like-in-kind components, which prohibits modifications such as LED retrofits. The (02) Residential specialty petition seeks to allow residential specialty electricians and contractors to perform wiring in multi-family residential buildings based on the type of construction and the allowance in the NEC® for non-metallic sheathed cable in multi-family buildings. Currently, residential specialty electricians are limited to multi-family buildings not exceeding three stories above grade.

The department has begun the formal rulemaking process to consider input from all stakeholders regarding these issues. A special stakeholder meeting was held September 26 to discuss the proposals and provide an opportunity for stakeholders to give feedback to the department. The meeting was well attended and the concepts for the proposals were unanimously supported by all stakeholders responding. A draft of the proposed rule language will be posted on the Rule Development page of our website shortly. The proposals will be shared with the Electrical Board at their October 26 meeting in Spokane. After the department receives the board’s advice regarding the proposals, a public comment period and hearing will be announced. For the latest developments on this and other rulemaking, watch for future announcements in this newsletter and the Rule Development page.

**Wireless Security Systems – When is a Permit Required if Powered by Field Wiring?**

Answer: Always. Most wireless security control panels installed today are powered by a field-terminated plug-in Class 2 power supply like the one pictured to the right. Contractors installing Class 2 low-voltage cable can use the Class B random inspection process as described in WAC 296-46B-908 or the regular permit and inspection process. A licensed telecommunications or electrical contractor must employ the installer. Because this kind of limited-energy interconnection is associated with a wireless telecommunications device, it is within the (09) telecommunications specialty and installers are not required to be certified electricians.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: [http://www.ElectricalCurrents.Lni.wa.gov](http://www.ElectricalCurrents.Lni.wa.gov)

If a wireless control panel comes factory equipped with a manufactured power supply requiring no field terminations – similar to a laptop computer portable power supply and no cables are concealed, it is not a regulated electrical/telecommunications installation when no other wiring is installed.

**Voltage Drop Calculations**

The NEC®, according to 90.1(B) contains provisions that are considered necessary for safety, and provides requirements that result in an installation that is essentially free from hazard but not necessarily efficient, convenient, or adequate for good service or future expansion of electrical use. A good example of this is an informational note regarding voltage drop for branch circuits and feeders in 210.19(A). Although the NEC® does not require it, the informational note states for reasonable efficiency of operation, conductors for branch circuits should be sized to prevent a voltage drop not exceeding 3 percent at the farthest outlet, and the voltage drop on both feeders and branch circuits should be limited to 5 percent at the farthest outlet.

There is a need to establish some uniformity in the calculation method used for voltage drop problems. Like fault current calculations, there are several methods that may be used to arrive at a theoretical “voltage drop”. Parameters considered can include conversion of DC resistance to AC impedance, internal cable structure, operating temperatures, and raceway material. Many of these calculations must be done on the jobsite where circuit conductor lengths and sizes are established during the installation. We base exam questions on the following (simplified) method we believe is best adaptable to the field when used as described.

The \[ VD = \frac{(2 \times K \times I \times L)}{wire \text{ circular mils}} \] formula deals with only two (Al and Cu) conductor resistivity constants (K) in addition to one-way circuit length (L), load amps (I), and wire size expressed in circular mils (from NEC® Chapter 9, Table 8). The constant (K-resistivity in ohms per circular mil-foot) is assumed to be 12.9 for copper wire and 21.2 for aluminum wire. You can calculate these approximate values from Chapter 9, Table 8 \((\text{ohms} \times \text{kc mil}) ÷ 1000 \text{ ft})\). The K values are valid at 75°C (167°F) and constitute a conservative worst-case for the utilization of typical building wire. Though you may accurately adjust K or DC resistance for temperatures other than 75°C (167°F) and for the effects of AC self-induction, our basic electrical exam questions do not require this level of detail.

**How to Avoid Employing People who do not Renew Their Certificates**

At any given time, there are expired trainees, electricians, and administrators working for unknowing electrical contractors. This can lead to trouble for everybody for not following what the law requires. Often, forgetting or waiting to renew because they have not completed continuing education or basic classroom training is the cause. The department sends a reminder to all certificate holders when they are eligible to renew 90 days before they expire. It is easy to know whether your employees are working with active certificates by verifying their status at the Verify a Contractor, Tradesperson or Business page of our website. You may want to consider using a calendaring program to set a reminder 90 days prior to everybody’s expiration date to alert you when certificates are eligible to be renewed.

If someone is looking for an approved class to fulfill their education requirements, you can refer them to the Electrical Workers’ Educational Requirements page of our website.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. Have a blown fuse and don’t have a proper replacement? No problem. Just use a knife switch. An electrical contractor found this butter knife in a fusible disconnect switch on a farm. They were unable to find a current rating on this knife, and the arcing created by the knife damaged the fuse holders, so the farmer agreed to have it replaced.

**Answer to Question of the Month:** NEC® 422.10(A), and 422.11(A). You may apply the more specific requirements of Article 422 to an electric furnace, which meets the definition of an appliance in NEC® Article 100.
Question of the Month – For an on-site residential septic system with one 120-volt pump, how many branch circuits are required by the Department of Health (DOH) to supply the system? See correct answer on Page 2.

Electrical Inspector Positions Available
Are you an experienced (01) general journey level electrician looking for a new challenge? Have you ever thought about becoming an electrical inspector? If you enjoy working with people, the time may be right for you. As an electrical inspector, you will need to foster good relationships with electrical contractors, electricians, and the public. If you want to help ensure electrical safety in Washington and help electrical contractors and electricians by enforcing laws related to the underground electrical economy, this could be just what you are looking for. It is a great job with a great benefit package. Inspectors have a challenging workload inspecting a wide variety of interesting and complex electrical installations. You can get more information and apply for present and future openings by visiting the Find a Job at L&I page of our website.

Stakeholder Meeting Notice – Sign and Residential Specialty Scopes of Work
The department has received two petitions from stakeholders to modify the (04) Sign and (02) Residential specialty workscopes. The (04) Sign specialty petition seeks to include energy efficient retrofitting of exterior luminaires that are mounted on a pole or other structure. Current language allows the sign specialty to service, maintain, or repair these luminaires with like-in-kind components, which prohibits modifications such as LED retrofits. The (02) Residential specialty petition seeks to allow residential specialty electricians and contractors to perform wiring in multi-family residential buildings up to 7 stories high based on the type of construction. Currently, residential specialty electricians are limited to multi-family buildings not exceeding three stories above grade. The department has begun the formal rulemaking process to consider input from all stakeholders regarding this issue. A special stakeholder meeting is scheduled for Tuesday, September 26, 1:00 p.m. in the Orcas Room, fifth floor of Tacoma Rhodes Center, 949 Market Street, Tacoma, WA. A parking garage is located on the west side of Market Street with a sky bridge leading to the fifth floor of the Rhodes Center.

Focus on improving Inspection Response Time
We are on a mission to improve our inspection response time. One of the issues making our response times suffer is, having to make too many trips to get an inspection done. Leading any installation code items are corrections for not being able to gain access, work not ready to inspect, and work where only some of the previous corrections were completed. It is not a perfect world, but we all can improve if everyone works together. When we reach a point where we are inspecting most jobs within 24 hours, we should get fewer phone calls about when we are coming and access likely improves because we are more predictable. Everybody saves time when we have access instructions that get us in without making phone calls, and we get inspections done within 24 hours more often. When inspectors make wasted trips because they did not get access, jobs are not ready, or basic code violations were found – all of which cause another trip for everyone - our 24-hour response time suffers.

To improve response time, we need to search out and remove waste in our processes and help others do the same. Most of today’s inspectors were not inspectors before the last recession. Many installers are new to the electrical trade as well. Everybody is hiring. That puts all of us in training mode. Everybody has a role in the inspection process; together we can find ways to improve.

Safety Tip of the Month
Never defeat an electrical safety device. When shock or fire protection is defeated, everyone is in danger. Remember the tragedies that caused those devices to be required. Nothing is important enough to put others in danger!
Corrections related to installation code violations are also very costly. Below are the top ten installation code corrections issued to electrical contractors last year.

1) NEC 110.3(B) Listed and labeled electrical equipment not installed in accordance with the manufacturer’s installation instructions included in the listing and labeling.
2) NEC 210.8(A) Ground-fault circuit-interrupter protection requirements for dwellings.
3) NEC 408.4(A), 110.22(A) Failing to ensure accurate labeling of the panel schedule or circuit directory, or the disconnecting means not properly labeled.
4) NEC 210.12(A) Arc-fault circuit-interrupter protection requirements for dwellings.
5) NEC 250.104(B) Bonding of metal piping systems including gas piping.
6) WAC 296-46B-250(2) Concrete encased electrode required for new building or structure that is built upon a permanent concrete foundation.
7) NEC 110.12(A) Failing to seal unused openings in electrical equipment.
8) NEC 110.7 Wiring integrity – completed wiring installations shall be free from short circuits ground faults, or any unpermitted connections to ground.
9) NEC 314.20 Flush-mount device boxes not flush with combustible surfaces or more than ¼” recessed from non-combustible surface.
10) NEC 314.25 Each box shall have a cover, faceplate, lampholder, or luminaire canopy.

We can improve response times significantly if jobs done by licensed electrical contractors pass inspection on the first try. Is there something administrators, contractors, installers, or the department can do to improve? Please give me your feedback at ElectricalProgram@lni.wa.gov.

Requirements for Wiring in Exterior Walls – Siding Nail Installation

WAC 296-46B-010(6) was recently changed. To provide additional protection to wiring from damage by siding nails, the language underlined below was added:

Prior to completion of an exterior wall cover inspection, either:

a) the exterior shear panel/sheathing nail inspection must be completed by the building code inspector and where siding nails or fasteners which penetrate into the wall cavity are to be used, all siding must be installed; or
b) all wiring and device boxes must be a minimum of 2 ½ inches from the exterior surface of the framing member; or
c) all wiring and device boxes must be protected by a steel plate a minimum of 1/16 inch thick and of appropriate width and height installed to cover the area of the wiring or box.

Notice that there are three options – a) or b) or c). The new requirement for installation of the siding was placed as an addition to paragraph a), the first option of requiring the shear panel/sheathing nail inspection to be completed. The second and third options of placing all wiring and device boxes at least 2 ½ inches from the exterior surface of the framing member (i.e., stud), or protecting the wiring and boxes with steel plates is still available.

Typically, if the exterior walls of a dwelling are of 2X6 studs, there won’t be a problem because the wiring and deep device boxes will have at least 2 ½ inches of clearance. Exterior walls with 2X4 framing will typically require the siding to be installed unless additional protection for your wiring is provided.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. Do not leave it up to the inspector to find hazardous damage like this. If you install wiring before the sheathing or siding is installed, it is your responsibility to protect your wiring and make sure it is not damaged before inspection.

Answer to Question of the Month: Two – WAC 246-272A-0238, enforced by DOH (not L&I) requires audible and visual alarms for all septic pumps. Pumps and alarms must be on separate circuits.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to:
http://www.ElectricalCurrents.lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/

This document is available in alternative formats to accommodate persons with disabilities. For assistance, call 1-800-547-8367. (TTD/TTY users, please call 360-902-5797.) Labor & Industries is an Equal Opportunity employer.
Question of the Month – Look at the ugly picture on page 2. Assuming the feeder supplying this panel is connected to a 240/120 volt system, and complies with NEC® 200.6 and 200.7, what voltage is being applied to a light fixture supplied by the branch circuit in the pic? See correct answer on Page 2.

Accomplishments for Year Ending June 30, 2017 – FY17
Increased demand for permits, inspections, plan review, and licensing reflect Washington’s continuing economic recovery. Here is what happened in FY17, which demonstrates the amount of work performed by our dedicated staff:

- 92% of the 147,124 electrical permits sold were purchased online.
- 82% of the 240,235 electrical inspection requests made were done online.
- Over 2 million miles were driven reasonably safely.
- System improvements make it possible for near real time inspection results.
- Inspectors issued 43,401 corrections for serious code violations. These represent about half of total corrections and are violations that could result in disconnection of power if not corrected. By far, property owner permits are most likely to receive serious corrections. At least one serious correction was issued for 50% of property owner inspections, compared to 15% for electrical contractor inspections.
- The economy is improving and our inspection response time declined slightly. For FY17, we responded to approximately 70% of inspections within 24 hours of the date requested and 87% within 48 hours. Unfortunately, this means that 31,422 customers had to wait more than 48 hours for inspection. Number of inspectors and workload affects response times. Before the layoffs of 2009 and 2010, we had 144 inspection staff; now we would have 130 if we could attract qualified applicants for vacant positions. Filling vacant positions and restoring inspectors as the economy improves will be key to improving our response time.
- Our team of dedicated plans examiners reviewed over 8,000 pages of drawings for educational, institutional, or health care facilities to ensure the design for these facilities meets the minimum requirements for electrical safety. The number of pages received represents an increase of about 14% over the previous year. As a result, the average backlog for a set of plans awaiting review in FY17 was 2.6 weeks.
- The correction reduction initiative realized a 25.6% improvement in the number of corrections written to the group of contractors identified as having the most corrections per inspection the previous fiscal year. These contractors receive a list of their corrections each month and are encouraged to use the information to help their electricians improve the quality of their installations. Typically, 20% of contractors receive 80% of corrections.
- 3,557 citations were issued for the focused underground economy. These violations include failing to obtain electrical permits, unlicensed electrical contractors, or uncertified electricians. This represents a decrease from the previous year’s 4,172 citations and may be due to increased workload for inspections.
- The licensing section processed 27,231 licenses (contractor, electrician, and trainee applications and renewals). Almost 100% of these were processed the same day they were received.
- Our auditors reviewed affidavits of experience for 1,744,801 electrical trainee and out-of-state experience hours to qualify for electrical certification examinations. Of those, 1,100,178 were denied. Reasons for denial include inability to verify out-of-state experience, lack of or inactive training certificates, lack of proper supervision (sometimes no certified electricians on staff), inability to verify employment (no legal employment records), lack of electrical permits to verify work performed, and lack of valid contractor licensing.

Why Correction Notices Reference 2017 NEC® and WAC 296-46B
Permits purchased before July 1, 2017 are inspected to the 2014 NEC® and WAC 296-46B. If corrections are noted on these permits, they will begin 2017 inspection to the 2017 NEC® and WAC 296-46B. This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov
jobs, the correction notice will reference the 2017 NEC® and WAC 296-46B. This is because the inspection program used by inspectors references what is currently adopted. While these jobs will not have to comply with the 2017 NEC® and WAC 296-46B, it is not likely that a correction for a requirement from the previous code not in the 2017 version would be issued. If a significant code reference change is involved, the inspector can note it as added text in the correction notice. Our approach has always been to work out of the latest code while keeping in mind that we may be looking at installations designed, permitted and installed under previous editions of the NEC®.

**Deadline for Public Input for 2020 National Electrical Code® is Sept 7, 2017**

The National Fire Protection Association (NFPA) is accepting public input (proposals) for the 2020 edition of the National Electrical Code® (NEC®) until September 7, 2017. The deadline is nearing, so if you have ideas for improvement to the NEC®, you have only a short time to submit them. Anyone can submit a public input. You may do so online at NFPA’s website at this [link](http://www.NFPA.com). Once there, you will need to create a user name and password, which will also allow you to view a read-only copy of the NEC® and other NFPA standards.

**Petition for Rulemaking – 04 Sign Specialty Scope of Work**

The department has received a petition from stakeholders to modify the (04) Sign specialty workscope to include energy efficient retrofitting of exterior luminaires that are mounted on a pole or other structure. Current language allows the sign specialty to service, maintain, or repair these luminaires with like-in-kind components, which prohibits modifications such as LED retrofits. The department will begin the formal rulemaking process to consider input from all stakeholders regarding this issue. Watch future editions of this newsletter for more information about how to provide input to the department.

**Correction to the July 2017 Defective PV Module Article**

The [July 2017](http://www.ElectricalCurrents.Lni.wa.gov) newsletter reported that potentially defective PV modules had been discovered. The article incorrectly reported that Intertek recommended removing the modules from service if they bear the eETLUS certification mark with adjacent Control Numbers 3182708 or 4003418. Intertek only recommends removing the modules from service if they show signs of delamination. See the [notification](http://www.Intertek.com) from Intertek for more information.

**Corrections to the June 2017 Special Edition Newsletter**

Two paragraphs in the [June 2017 Special Edition](http://www.ElectricalCurrents.Lni.wa.gov) newsletter, which highlight changes in ground-fault protection and plan review requirements need clarification.

- NEC® 210.8(B) and (E) – the title of the paragraph refers to ground-fault protection for personnel – “other than dwelling units”. We want to clarify that the 210.8(E) requirement for GFCI protection for crawl space lighting outlets applies to all occupancies – including dwelling units.
- WAC 296-46B-900 plan review requirements for electric power production sources. The paragraph incorrectly stated plan review is required for power production sources with a total rating of “9600 watts or more”. It should have stated plan review is required for power production sources with a total rating of “more than 9600 watts”.

**Contractors – Be Sure Customers Know Inspections Need to Happen**

We are finding customers not knowing what they need to know about inspections. Too often, we hear customers who claim, “My electrical contractor never told me I needed an inspection”. Some are reluctant to allow access to an inspector. If everyone knows that an inspection is required and what to expect, inspectors can focus on getting inspections done, which improves response time and reduces delays. Over two-hundred forty thousand electrical inspections were done last year. Probably more inspections will happen this year. Everybody’s time is important. Inspections are about safety and everybody needs to work together to get them done. Ultimately, it is the contractor’s responsibility to make sure inspectors get access. It is our responsibility to get there in a timely fashion. Together, we can help each other by ensuring customers know access is required and inspection requests include clear access instructions that get inspectors access to inspect.

**Ugly Picture:** Obviously, this installer did not consult the manufacturer’s installation instructions (or use common sense)! If viewing this document online, click on the picture to open a larger image.

**Answer to Question of the Month:** 240 volts. The light bulb would shine very brightly for a very short time.
Question of the Month – When installing a photovoltaic system on a one- or two-family dwelling, where must the rapid shutdown initiation device be located? See correct answer on Page 2.

New WAC Rules Available Online
The WAC 296-46B revision process is complete and the 2017 NEC® is now effective for all electrical permits purchased on or after July 1, 2017. You can download a copy of the 2017 WAC 296-46B from the Laws and Rules page of our website. Click here for a direct link to the document. A printed version will soon be available for purchase in all L&I service locations. The cost of a printed copy is $5.80.

City of Sammamish to Assume Electrical Inspections
Labor and Industries was informed in June that the city of Sammamish will be taking responsibility for all electrical inspections within their jurisdiction on July 1, 2017. Permits and inspections for electrical installations within the city limits must be obtained from the city of Sammamish or at www.mybuildingpermit.com. For any questions regarding the city of Sammamish electrical permitting and inspection program, you may contact their permit center at 425-295-0531.

Do not purchase L&I electrical permits for work done in the city limits of Sammamish after July 1, 2017. L&I will continue to perform inspections on electrical permits already in progress or those purchased prior to July 1. Refunds are not allowed on any permit that has had an inspection.

Defective PV Modules Bearing Intertek Certification Marks
Intertek has issued a notification that certain flat plate photovoltaic modules manufactured by Silicon Energy for the United States and Canada may not comply with relevant safety requirements resulting in overheating and module failure. In some cases, there has been partial melting or burning of the panel at the point of failure. Intertek recommends removing the modules from service if they bear the cETLus certification mark with adjacent Control Numbers 3182708 or 4003418.

Requirements for Electrical Equipment - Recognized vs Listed Components
According to Underwriters Laboratories (UL), Recognized Components (identified by the mark) are products that are incomplete in construction features or limited in performance capabilities. The Recognized Component Mark does not provide evidence of listing or labeling which the National Electrical Code or other installation codes or standards may require. The State of Washington does not approve Recognized Components as stand-alone products. Recognized components can only be used in a product that has been certified (listed) as an assembly (e.g., inside a listed industrial control panel).

RCW 19.28.010(1) requires all electrical equipment to be manufactured to an applicable electrical safety standard. WAC 296-46B-010(7) clarifies electrical equipment must be:

Safety Tip of the Month
Beat the Heat - How to avoid heat related illness:
• Stay hydrated with water, avoid sugary beverages.
• Stay cool by seeking shade or an air-conditioned area.
• Wear light-weight, light colored, loose fitting clothes.
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.

The marks to the right are some of the more common “listing” marks used to indicate a product has been certified by a product testing laboratory. 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.

### Permit Fees for Low-Voltage HVAC (Thermostat) Control Cable

A separate permit fee is always required for low-voltage installations of HVAC control cable and/or thermostats unless a Class B label is used for like-in-kind replacement of an HVAC unit. There are two options for permits for low-voltage (thermostat) cable installations (i.e., the Class B random inspection process and the standard electrical work permit). Class B random inspection labels may be used for repair or replacement of low-voltage devices (e.g., thermostats), or for installation of low-voltage devices or wiring where the installation does not exceed five thousand square feet. The Class B random inspection process may also be used for like-in-kind replacement of an electric/gas/oil furnace not exceeding 240 volts and 100 amps, or an air conditioning unit or heat pump not exceeding 240 volts and 40 amps. When a Class B label is used for a like-in-kind replacement of an HVAC unit, the low-voltage (thermostat) cable associated with the like-in-kind replacement is included on the same Class B label. For installation of low-voltage cable to a new HVAC unit, however, a separate label is required. Like-in-kind replacement of a furnace along with installation of a new heat pump would require two Class B labels. One for the like-in-kind replacement including all associated low-voltage cable, and one for the new low-voltage cable to the new unit. Of course, the branch circuit to the new heat pump would require a standard electrical work permit and installation of the branch circuit is not within the scope of the HVAC specialties.

A standard electrical work permit may be used for low-voltage HVAC control cable and thermostats. If a standard permit is used, the fee must be as stated in WAC 296-46B-906(5)(a). The fee is currently $46.80 for the first thermostat (and associated cable) and $14.50 for each additional thermostat inspected at the same time as the first. This fee item only applies to thermostats and associated cable that control a single piece of utilization equipment or a single furnace and air conditioner combination. Installation of low-voltage devices and control wiring for energy management control systems require the fees stated in WAC 296-46B-906(5)(b). This fee is based on the square footage of the installation and is currently $54.30 for the first 2500 square feet or less, and $14.50 for each additional 2500 square feet or portion thereof. When purchasing a standard permit online or using the permit fee worksheet, the “Thermostat” item is used for installations or modifications of thermostats and all associated low-voltage control wiring.

### Answer to Question of the Month: 2017 NEC® 690.12(C) – An initiation device or devices shall be located at a readily accessible location outside the building. A rapid shutdown switch must be labeled in accordance with 690.56(C)(3).

### Ugly Picture: If viewing this document online, click on the pictures to open larger images. It is easy to forget to complete a task. Get in the habit of double-checking your work to make sure important elements of each installation are completed properly. Costly damage may result if every electrical termination is not properly installed. The additional reminder to use a calibrated torque tool required by 2017 NEC® 110.14(D) may help.
SPECIAL EDITION

Significant 2017 NEC® & WAC 296-46B Changes

This issue is dedicated to a review of some of the significant changes in the 2017 National Electrical Code (NEC®) and WAC 296-46B Electrical Safety Standards, Administration and Installation electrical rules. The department adopted revisions to WAC 296-46B, including adoption of the 2017 NEC® with an effective date of July 1, 2017. Installations made under any electrical permit purchased on or after July 1, 2017 are subject to the requirements of the 2017 WAC 296-46B and the 2017 NEC®.

The recent rulemaking process was necessary to align the previous July 2014 WAC 296-46B (based on the 2014 NEC®) with the 2017 NEC®. The department adopted very few amendments to the NEC®.

This document does not cover all changes. It is meant to assist you in becoming aware of some of the significant changes in the 2017 NEC® and changes to WAC 296-46B. The explanations vary from the actual code language; for clarification, refer to the 2017 NEC® and/or WAC 296-46B. A complete version of the 2017 WAC 296-46B will soon be available at: http://www.lni.wa.gov/TradesLicensing/Electrical/LawRulePol/LawsRules/default.asp.

- **WAC 296-46B-010(6)(a) – Exterior Wall Cover Inspections.**
  Prior to completion of an exterior wall cover inspection, the exterior shear panel/sheathing nail inspection must be completed by the building code inspector and, where siding nails or fasteners which penetrate into the wall cavity are to be used, all siding must be installed; or all wiring or device boxes must be a minimum of 2 ½ inches from the exterior surface of the framing member; or all wiring and device boxes must be protected by a steel plate at least 1/16 inch thick and of appropriate height and width to cover the area of the wiring or box.

- **NEC® 110.14(D) – Electrical Connections – Installation.**
  Where a tightening torque is indicated as a numeric value on equipment or in installation instructions, a calibrated torque tool must be used to achieve the indicated torque value, unless the equipment manufacturer has provided installation instructions for an alternative method of achieving the required torque.

- **NEC® 110.16(B) – Arc-Flash Hazard Warning – Service Equipment.**
  In other than dwelling units, a permanent label must be applied to service equipment rated 1200 amps or more, which states nominal system voltage, available fault current, clearing time of service overcurrent protective devices, and date the label was applied.

- **NEC® 210.8(B) and (E) – Ground-Fault Circuit-Interrupter Protection for Personnel – Other Than Dwelling Units.**
  GFCI protection for other than dwelling units has been expanded to include:
  - All single-phase receptacles rated 150 volts to ground or less (i.e., 120V, 208V and 240V), 50 amperes or less in the specified locations. Washington did not adopt an additional requirement for GFCI protection for three-phase receptacles rated up to 100 amperes.
  - Crawlspace receptacles – at or below grade level.
  - Receptacles in unfinished portions or areas of the basement not intended as habitable rooms.
  - Crawlspace lighting outlets not exceeding 120 volts.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.Lni.wa.gov
NEC® 210.11(C)(4) – Branch Circuits Required – Dwelling Unit Garages.
At least one 120-volt, 20 ampere branch circuit must be installed to supply receptacle outlets in attached garages and in detached garages with electric power. The circuit shall have no other outlets.

NEC® 210.12(C) – Arc-Fault Circuit-Interrupter Protection – Guest Rooms and Guest Suites.
All 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels must have AFCI protection.

NEC® 210.52(C)(3) and WAC 296-46B-210(8) – Dwelling Unit Receptacle Outlets – Peninsular Countertop Spaces.
The 2017 NEC® changed how peninsular countertop spaces are measured. Revised language states the peninsula is measured from the connected perpendicular wall. This change allows a receptacle installed in the wall at that space to count as the required receptacle serving the peninsula. WAC 296-46B-210(8) amends this to allow the wall receptacle to serve the peninsula only where the receptacle is located within 8 feet of the outside edge of the peninsular countertop.

NEC® 210.71 – Meeting Room Receptacles.
Meeting rooms of not more than 1000 square feet in other than dwelling units must have 120-volt 15- or 20-ampere receptacles installed in the specified locations.

WAC 296-46B-240(1) – Overcurrent Protection – Not Exposed to Physical Damage.
A new rule establishes minimum mounting height requirements for enclosures installed outdoors containing overcurrent devices. Generally, the minimum mounting height of the enclosure is 24 inches above finished grade unless the enclosure meets the specified conditions.

A new rule reflecting existing policy specifies when a grounding electrode conductor will be considered to be not exposed to physical damage. This rule was placed in WAC 296-46B to align with current department policy established in the November 2011 Electrical Currents newsletter.

NEC® 250.94 – Intersystem Bonding Termination Device.
WAC 296-46B-250 was revised to eliminate a rule that exempted installations from the requirements of NEC® 250.94. This means that an intersystem bonding termination device meeting the requirements of NEC® 250.94 must be provided external to enclosures at the service or metering equipment, or at the disconnecting means for separate buildings to provide a grounding means for communications systems.

NEC® 310.15(B)(3)(c) – Raceways and Cables Exposed to Sunlight on Rooftops.
Table 310.15(B)(3)(c) was deleted and replaced with text requiring an ambient temperature adder of 33°C only when a raceway or cable is installed less than 7/8 inch above a rooftop in direct sunlight. This would be a violation however, because the general rule states that raceways or cables shall be installed a minimum of 7/8 inch above the roof to the bottom of the raceway or cable. Anyone up for a 2020 NEC® public input on this one?

NEC® 310.15(B)(7) – Single-Phase Dwelling Services and Feeders.
The allowance to reduce the feeder size for residential feeders that supply the entire load of a dwelling unit was expanded to include single-phase feeder conductors consisting of 2 ungrounded conductors and the grounded conductor of a 208Y/120V system.

NEC® 338.10(B)(4) – Ampacity of Type SE Cable Installed in Thermal Insulation.
Where Type SE cable is used as interior branch circuits and feeders and where installed in thermal insulation, the ampacity shall be in accordance with the 60°C conductor temperature rating only for cables with ungrounded conductor size 10 AWG or smaller. For cables larger than 10 AWG, the ampacity shall be based on the rated
operating temperature of the specific cable after applicable correction and adjustment factors are applied (See NEC® 310.15(A)(3) for temperature limitation of conductors).

- **NEC® 406.12 – Tamper-Resistant Receptacles.**
  
  Requirements for tamper-resistant receptacles has expanded to pre- and elementary schools, certain areas of medical and dental offices, gymnasiums, skating rinks, auditoriums, and dormitories.

- **NEC® 430.99 – Motor Control Centers – Marking Available Fault Current.**
  
  The available short circuit current at the motor control center and the date the short circuit current calculation was performed shall be documented and made available to those authorized to inspect the installation.

- **WAC 296-46B-440 – Split System HVAC/R Disconnecting Means.**
  
  This requirement did not change, but was relocated from WAC 296-46B-424. In one- and two-family dwelling units, a disconnecting means is required for the indoor unit(s) of a split system HVAC/R system, unless the outside unit’s disconnecting means is lockable, disconnects the indoor unit and an indoor disconnecting means is not required by the manufacturer.

- **WAC 296-46B-553 – Floating Buildings – Ground-Fault Protection.**
  
  The ground-fault protection specified in NEC® 553.4 is amended to require all overcurrent protective devices that supply the floating building to have ground-fault protection not exceeding 30 mA. Until July 1, 2018, the ground-fault protection level is amended to allow a maximum of: 100 mA for overcurrent devices supplying feeder conductors; and 30 mA for overcurrent devices supplying branch circuit conductors and outlets. This one-year period will allow further consideration of the concern that 30 mA protection of feeders may cause unwanted tripping due to cumulative leakage currents from multiple circuits.

- **NEC® 555.3 and WAC 296-46B-555(1) – Marinas, boatyards, and commercial and noncommercial docking facilities.**
  
  All overcurrent protective supplying marinas, boatyards, and commercial and noncommercial docking facilities must have ground-fault protection not exceeding 30 mA. Until July 1, 2018, the ground-fault protection level is amended to allow a maximum of: 100 mA for overcurrent devices supplying feeder conductors; and 30 mA for overcurrent devices supplying branch circuit conductors and outlets. This one-year period will allow further consideration of the concern that 30 mA protection of feeders may cause unwanted tripping due to cumulative leakage currents from multiple circuits.

- **NEC® 555.24 – Signage – Marinas, boatyards, and commercial and noncommercial docking facilities.**
  
  Permanent safety signs must be installed to give notice of electrical shock hazard risks to persons using or swimming near a boat dock or marina stating – “WARNING – POTENTIAL SHOCK HAZARD – ELECTRICAL CURRENTS MAY BE PRESENT IN THE WATER.”

- **NEC® 700.3(F) – Emergency Systems – Temporary Source of Power for Maintenance or Repair of the Alternate Source of Power.**
  
  New provisions for providing permanent switching means to connect a portable or temporary alternate source of power when an emergency system relying on a single alternate power source will be disabled for maintenance or repair.

- **NEC® 700.10(D) – Emergency Systems – Fire Protection of Wiring.**
  
  Additional fire protection requirements were added for emergency system feeders in health care facilities where persons are not capable of self-preservation, and educational facilities with more than 300 occupants. These requirements currently apply to high-rises and assembly occupancies of greater than 1,000 persons.

In addition to the requirements of NEC® 705.31, electric power production source conductors connected to the supply side of the service disconnecting means must be installed using wiring methods specified for service conductors in WAC 296-46B-230(7).


Plan review will be required for electric power production sources such as solar photovoltaic, fuel cell, and wind electric systems with a total rating of 9600 watts or more, when installed at educational, institutional, or health care facilities.

• WAC 296-46B-901(9) – Requests for Inspections – Temporary Installations.

Where temporary installations will be energized for less than 48 hours (e.g., load banks, generators, etc.) a request for inspection must be made by contacting the local electrical inspection supervisor at least three working days prior to the requested date of inspection.

• WAC 296-46B-908(10) – Class B Random Inspection – Scope of Work.

The scope of work for Class B random inspection labels was expanded to include:

- A single, line-voltage flexible supply whip associated with like-in-kind replacement of HVAC equipment. This may be done on the same Class B label with the replacement unit if done at the same time.
- Replacement of not more than ten standard receptacles with AFCI receptacles.
- The installation or replacement of a single electric sign on an existing 120-volt, 20-amp maximum branch circuit.

• WAC 296-46B-915 – Civil Penalty Schedule.

The penalty schedule was revised as follows:

- A lower penalty amount was specified for failing to display a certificate of competency while working in the trade provided the person possesses a valid, active certificate. Penalty amounts are $50 for the first offense and $100 for each offense thereafter.
- A new penalty amount was specified for causing or failing to correct a serious violation. A serious violation is a violation of chapter 19.28 RCW or 296-46B WAC that creates a hazard of fire or a danger to life safety. Penalty amounts are $1,000 for the first offense, $3,000 for the second offense, and $5,000 for each offense thereafter. Depending on the violation, a first offense could result in suspension of the person’s certificate of competency.

• WAC 296-46B-925(22) – Licensing Exemptions – Manufacturers of Electrical/Telecommunications products.

The allowance for manufacturer’s authorized factory-trained technicians to perform replacement of electrical components within the confines of a product without licensing during the manufacturer’s written warranty period was limited to a period not to exceed one year from the date of original installation of the new product.

• WAC 296-46B-935(12) and 940(12) – Activating a Suspended Administrator’s or Electrician’s Certificate.

Clarification was made that before a suspended administrator’s or electrician’s certificate can be activated, the holder must pass the appropriate administrator or electrician examination in accordance with RCW 19.28.211(2).

• WAC 296-46B-970(5)(vi) – Instructor Approval Minimum Requirements.

An addition was made to the list of qualifications for continuing education and classroom education instructors to allow subject matter experts approved by the chief electrical inspector who can demonstrate appropriate knowledge of, and experience in the electrical construction trade and working as an electrical/electronic trainer.
Question of the Month – According to 2015 NFPA 70E Standard for Electrical Safety in the Workplace, what are the 4 conditions where work on energized electrical conductors and circuit parts is permitted? See correct answer on Page 2.

2017 NEC® and WAC 296-46B to be Effective July 1, 2017

The WAC 296-46B revision process with adoption of the 2017 National Electrical Code (NEC®) is complete. The director signed the CR-103 rulemaking order on May 30, 2017. The 2017 NEC and revised WAC 296-46B will be effective July 1, 2017. All installations where permits are purchased on or after July 1 must comply with the 2017 NEC® and revised rules. There were three revisions made after the public comment period which are explained in the article below in this edition. You can review a copy of the revised rules on the Rule Development page of our website. Soon, a special edition Electrical Currents newsletter will be published which will highlight the significant changes. We are also working to revise the print version of the rules, which should be available on our Laws & Rules page shortly and in service locations in July.

If you have not done so, now is a great time to take advantage of a 2017 NEC® update class. You can find approved continuing education and basic classroom training classes on the Educational Requirements page of our website.

Washington Amends Three 2017 NEC® Requirements in WAC 296-46B

Based on further research prompted by public comments, the department has adopted the following amendments to three requirements in the 2017 NEC®. These are included in the revised WAC 296-46B to be effective July 1, 2017.

- WAC 296-46B-210 008(B) Other than dwelling units – GFCI requirements
  GFCI protection for personnel will not be required for three-phase receptacles unless specifically required elsewhere in the NEC®. This is due to lack of availability of equipment to provide GFCI protection for three-phase loads.

- WAC 296-46B-553.4 Floating Buildings, and 555.3 Marinas, Boatyards, and Commercial and Noncommercial Docking Facilities – Comments were received in opposition to adoption of the 2017 NEC® requirement for 30 mA ground-fault protection for all overcurrent devices supplying these facilities due to reports that the 30 mA protection level for feeders will not accommodate the cumulative leakage current present at most marinas. The department believes further consideration is warranted and is proposing a one-year period to allow further public input and consideration of this requirement. A sentence was added to these two sections of WAC 296-46B stating: Until July 1, 2018, the ground-fault protection level specified in (WAC 296-46B-553.4 and 2017 NEC® 555.3) is amended to allow a maximum of: 100 mA for overcurrent devices supplying feeder conductors; and 30 mA for overcurrent devices supplying branch circuit conductors and outlets. Unless permanent rulemaking amends these changes, effective July 1, 2018, all overcurrent protective devices supplying floating buildings, marinas, boatyards, and commercial and noncommercial docking facilities must have ground-fault protection not exceeding 30 mA as specified in the 2017 NEC. This is an important safety requirement to help prevent electric shock drownings at these facilities, which was discussed in the April 2016 Electrical Currents newsletter.

Unless changed by subsequent rulemaking, the ground-fault protection level for all overcurrent devices supplying floating buildings, marinas, boatyards, and commercial and noncommercial docking facilities will be 30 mA beginning July 1, 2018.

Safety Tip of the Month

Do not allow yourself or anyone else to swim near a dock or marina where electrical power is present. Stray leakage current in the water can paralyze or kill.

If you must enter the water to work on a boat or dock, turn off and lock out all sources of electricity first.
NFPA Issues 2017 National Electrical Code® Corrections and Revisions

The NEC® is a complex document with thousands of people working together to bring it to publication every three years. Sometimes there are errors and omissions that need correction after publication. The NFPA addresses this by issuing errata and tentative interim amendments (TIAs). A TIA is an amendment to the standard after publication to correct an error or adopt an emergency revision. In addition to TIAs, NFPA publishes Errata, which correct errors in the standard after publication. To date, in the 2017 NEC® there have been four TIAs and four errata issued. To see current TIAs and Errata, visit the Current and Prior Editions tab of the NFPA 70 (NEC®) web page, and then mark your copy of the 2017 NEC® to reflect the changes.

Submit Your Proposals for the 2020 NEC® Now

If you have a proposal that you believe would improve the NEC®, you may submit a public input to NFPA for consideration for the 2020 edition. The public input period is open until September 7, 2017, so you will need to move quickly. NFPA starts the revision process for the next edition of the NEC® almost immediately upon publication of the previous edition. To submit a public input, visit the Next Edition tab of the NEC® web page. Select “Submit a Public Input” and you will be taken to a page where you can sign in or create a profile. It is free and open to the public. The page also includes a schedule of significant dates for revision of the 2020 NEC®.

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, but may not perform any electrical work. Owners and their regularly employed staff may work without being certified electricians, in accordance with RCW 19.28.261(5)(a), but they should be qualified to work on electrical systems. Except for some limited device replacement – see WAC 296-46B-901(7)(b)(i) 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). Specific requirements are mentioned in NEC® Article 605 – Office Furnishings, regarding electrical equipment, lighting accessories, and wiring systems used to connect, contained within, or installed on office furnishings.

Answer to Question of the Month: 2015 NFPA 70E 130.2(A)(1) through (A)(4):

(1) Where the employer can demonstrate that de-energizing introduces additional hazards or increased risk.
(2) Where the employer can demonstrate that the task to be performed is infeasible in a de-energized state due to equipment design or operational limitations.
(3) Work on parts that operate at less than 50 volts where it is determined that there will be no increased exposure to electrical burns or to explosion due to electric arcs.
(4) Normal operation of electric equipment shall be permitted under the specified conditions of use.

Ugly Picture: If viewing this document online, click on the picture to open a larger image. NEC® 240.24(A) and 404.8(A) require that all switches, and switches containing fuses and circuit breakers be readily accessible and installed so that the center of the grip of the operating handle of the switch or circuit breaker is not more than 6 ft. 7 in. above the floor or working platform. Don’t be like this contractor whose profit margin was eaten up by removing and lowering the panel.

WAC 296-46B Electrical Rule Revisions – Public Hearing

The proposed rule revision to WAC 296-46B regarding adoption of the 2017 National Electrical Code® (NEC®) is nearly complete. The department is responding to comments received during the public comment period and public hearing. There were very few comments in opposition to the proposed rules. The tentative rule filing date is May 23, and the effective date of the new rules will be July 1, 2017. All installations where the permit is purchased on or after July 1 must be in accordance with the new rules and the 2017 NEC®. You can review a copy of the proposed rules on the Rule Development page of our website. Soon, a special edition Electrical Currents newsletter will be published which will highlight the significant changes.

Typically, electrician examination questions do not change significantly with adoption of new versions of the NEC®. All electrical examinations will continue to be based on the 2014 edition of the NEC® until the exams are revised later next year. This will allow those who have been learning the trade to use their 2014 copy of the NEC® to take their exam.

If you have not done so, now is a great time to take advantage of a 2017 NEC® update class. You can find approved continuing education and basic classroom training classes on the Educational Requirements page of our website.

Where Are “Hospital Grade” Receptacles Required?

To adequately protect patients, health care facilities have very specific standards of installation that are often substantially different from a typical electrical installation. National Electrical Code® (NEC®) 517, Health Care Facilities, has special requirements for “patient care” spaces (e.g. redundant grounding/bonding, insulated copper equipment grounding conductors in metal raceways, MC or AC cables suitable for health care facility use, receptacle requirements, etc.).

NEC® 517.18(B), and 517.19(B) and (C) require that listed “hospital grade receptacles” be used in general and critical care space patient bed locations, and operating rooms. Critical care locations must be identified by the facility operator. On plan reviewed jobs, these will be identified on the approved plans. On jobs not requiring plan review, the inspector will ask the facility operator if the facility has any critical care procedure tables or patient bed locations.

NEC® 517.2 defines a “patient bed location” as the location of a patient sleeping bed, or the bed or procedure table of a critical care space. NEC® 517.2 also defines “critical care space” as an area where a patient is subjected to an invasive procedure and connected to a line-operated electromedical device. The definition describes operating rooms, delivery rooms, etc. Although not included in the NEC examples, dental chairs and other locations where an invasive procedure is performed and the patient is connected to a line-operated electromedical device are considered to be “critical care.”

Installers should also be aware the medical equipment manufacturers may also have specific requirements. Examination tables and dental chairs, for example, often have a manufacturer requirement that a “hospital grade” receptacle supply power to the table or chair.

WAC 296-46B-230(6) Marking of Service Conductor Ampacity on Service Equipment

Generally, service conductors must have overcurrent protection not greater than the ampacity of the conductors. NEC 230.90(A) specifies overcurrent protection requirements for ungrounded service conductors. As you can see, there are 5

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov

Safety Tip of the Month

The amount of electricity required to kill a person is very small. According to the OSHA publication Controlling Electrical Hazards, 50 to 150 milliamperes of electricity will cause extreme pain, respiratory arrest, severe muscular contractions and possible death. Use extreme caution, follow all safety procedures, and use required personal protective equipment while working on or near energized circuits.
exceptions listed, which if the conditions are met, allow an overcurrent device to be larger than the ampacity of the service conductors. These include allowances for higher overcurrent protective device ratings for motor-starting currents, next higher standard size for devices rated 800 amperes or less, main lug service equipment up to six disconnects, fire pump supply conductors, and residential services that supply the entire load of a dwelling. WAC 296-46B-230(6) requires an identification plate showing the ampacity of the service conductors to be installed on the service equipment if the conductors have a lesser ampacity than the overcurrent protection permitted by NEC® 230.90 or 310.15, or the equipment rating that they terminate in or on. The identification plate is required to alert installers of future increased electrical loads of the limiting factor of the ampacity of the service conductors even though the overcurrent device or equipment rating may appear to allow increased load.

The department will not require the identification plate to be installed for one- or two-family dwelling services rated up to 400 amperes, where the service conductors are protected in accordance with NEC® 230.90(A) including exceptions.

**Underground Low-Voltage Landscape Lighting and Sprinkler System Control Requirements**

We have been asked to clarify the intent of the rules relating to licensing, certification, permits, and inspections for the installation of specific types of underground low-voltage landscape lighting, and sprinkler control systems. WAC 296-46B-925(8) establishes an exemption for specific types of work and states “The electrical failure of these systems does not inherently or functionally compromise safety to life or property.” The rule exempts thermocouple derived circuits and low-voltage systems for built-in residential vacuum systems, underground landscape sprinkler systems, underground landscape lighting, and residential garage doors. However, for these types of systems to be considered exempt, the following conditions must be met:

- The power supplying the installation must be derived from a listed Class 2 power supply (This must be marked on the power supply along with the mark of the accredited testing laboratory. Most larger commercially available systems do not meet this requirement);
- The installation and termination of line voltage equipment and conductors supplying these systems is performed by appropriately licensed electrical contractors and certified electricians;
- The conductors of these systems do not pass through fire-rated walls, fire-rated ceilings or fire-rated floors in other than residential units; and
- Conductors or luminaires are not installed in installations covered by the scope of Article 680 NEC (swimming pools, fountains, and similar installations).

All other landscape lighting systems, and sprinkler control systems supplied by other than listed Class 2 power supplies must be done by licensed electrical contractors and certified electricians.

The rules have another exemption from licensing for firms that install certain cord and plug connected equipment in WAC 296-46B-925(10) provided “The equipment must be a single manufactured unit, including the plug and cord, that does not require any electrical field assembly except for the installation of the plug and cord and is allowed to be plug and cord connected by the NEC.” Field installation of low-voltage landscape lighting systems do not qualify for this exemption, even if the power source happens to be cord and plug connected.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. This “water cooled” electrical panel was discovered on a dock in Seattle. Thanks to an alert electrical contractor, the installation was corrected.

**Answer to Question of the Month:** July 1, 2017. All installations where the permit is purchased on or after this date must comply with the 2017 NEC® and 2017 WAC 296-46B.
Senate Budget Proposes to Sweep Electrical Fund

A dedicated account known as the Electrical License Fund is where the law requires your electrical permit and licensing fees to be deposited. This account is the sole funding source for the L&I electrical program. As of this writing, the fund has enough - about 8 million dollars - to support the L&I electrical program operations for about 4 months. Like any business, the electrical program cannot spend money if none is there to spend. A harsh example of a spending adjustment happened during the recession when L&I had to lay off about 50 electrical inspectors in 2009 and 2010 because there was not going to be enough in the fund to pay them. I know we were not alone in such actions. Many of you faced similar challenges. Recovery is proving to be a long process.

Every two years, the legislature sets a limit on the amount L&I can spend to operate the electrical program. Faced with an increasing workload brought on by our recovering economy, we requested additional spending authority for 18 positions needed to support the increased workload. The good news is that every budget proposal put forth this legislative session provides spending authority as requested. But there are big differences in the budget proposals now being considered by the legislature. The biggest differences are found in the Senate budget - ESSB 5048, which proposes to provide 9 inspector positions to L&I and earmark $2,117,000 to be used for grants to local governments to help them start their own electrical inspection programs. In addition, the Senate budget proposal would sweep another $2,000,000 from the electrical fund and deposit it into the general fund. When your contributions are swept away from a fund dedicated to support services you paid for, things like better inspection response times and more enforcement of licensing laws that support recovery will be hard to accomplish. The House proposal - HB 1067, and Governor’s budget proposals do not contain provisions to sweep the electrical fund.

In other legislative news, bills affecting the electrical industry discussed in the March 2017 newsletter have stalled and will not be moving forward this session. You can find more information about any legislation by visiting the legislative website at: http://leg.wa.gov/Pages/default.aspx.

WAC 296-46B Electrical Rule Revisions – Public Hearing

The proposed rule revision to WAC 296-46B regarding adoption of the 2017 National Electrical Code was filed on February 28, 2017, and is posted on the Rule Development page of our website. If you would like to comment on the proposed rule you may submit written comment or attend and comment at the public hearing. Written comments may be sent to Alicia Curry: PO Box 44400, Olympia, WA 98504-4400; Alicia.Curry@Lni.wa.gov; or by fax to 360-902-5292, by 5 p.m. on April 6, 2017. A public hearing will be held on April 6, 2017 at 9 a.m. at the Tumwater L&I building, 7273 Linderson Way SW, Tumwater, WA 98501.

Another rulemaking activity involves rules regarding provisions for temporary electricians and allowing a path for Canadian Red Seal Endorsed electricians to qualify for the 01 general certificate of competency exam. This was the subject of emergency rulemaking which became effective November 21, 2016. An extension was filed on March 21, 2017 extending the emergency rules for another 120 days. More information about this rulemaking can be found on the Rule Development page.

Safety Tip of the Month

DO NOT WORK ON AN ENERGIZED CIRCUIT!!!

Sorry for shouting, but as highly skilled electricians who know how to mitigate the hazards of working around dangerous electricity, we sometimes make foolish decisions. An OSHA report from 2015 indicates 81 construction workers died that year from electrocution. Even seemingly minor work such as replacing light switches or changing luminaire ballasts, if done while the circuit is energized, could result in an accident and cause serious injury or even death! Take the time to de-energize every circuit you are working on.

Don’t ruin your life and the lives of your loved ones by taking shortcuts and risks with electricity.
Working on Energized Service Drops

Question: Is an electrician permitted to disconnect and/or reconnect a secondary service drop on the utility’s side of the meter?

The short answer is no - only individuals who meet the training and experience requirements in WAC 296-45, Electric Power Generation, Transmission, and Distribution, are considered to be “qualified electrical employees” and able to work on or with exposed energized lines or parts of equipment operating at 50 volts or more.

The training that qualified electrical employees must have according to WAC 296-45 will include training necessary to work on energized primary and secondary conductors that are not typically protected by overcurrent devices. This qualifies the employee to take a clearance (i.e., receive authorization to work) on the lines or equipment to control the energy source when necessary. The training that Washington certified electricians receive may not be focused towards working on energized lines and equipment, except for testing and certain conditions where it is infeasible to de-energize.

Information on electrical safety-related work practices can be found in the General Safety and Health Standards, WAC 296-24-965 and NFPA 70E. These practices will give guidance to employers on allowing qualified electricians to work on energized utilization systems under limited circumstances. Work practices found in WAC 296-45-065 are applicable to work performed on the utility side of the metered demarcation line. If you would like more information, please contact Jeff Krausse, the DOSH Telecommunications and High Voltage Supervisor at 509-764-6908 or krau235@lni.wa.gov.

Electrical Board Openings

In July, there will be five seats on the Electrical Board that will be up for appointment by the Governor. Some of the seats are held by incumbents who are eligible for reappointment. The Board meets four times per year and serves a vital role in advising L&I on all matters pertaining to Washington’s electrical laws, rules, and policies. The role and membership of the Board is described in RCW 19.28.311. Seats that will be open for appointment or reappointment in July are: one representative of an electrical contractor association, one licensed professional electrical engineer who is also a registered communications distribution designer, one telecommunications worker, one outside line worker, and one certified electrician. You can submit an application or recommend an applicant using the forms on the Governor’s Boards & Commissions website. Application must be made using the Governor’s form. You may attach your resume and any additional information you would like considered at the bottom of the application before submitting. If you have any questions about completing the application, please contact Gov. Inslee’s Office by email or call 360-902-4111.

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

Due to recent questions, we are revisiting and clarifying department policy regarding temporary plug and cord wiring for carnivals, fairs, concerts, trade shows and similar events. This article supersedes a previous newsletter article printed in February 2012. 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, vendor, etc.) for plugging in their equipment.

Wiring a temporary power distribution system, using plug and cord wiring methods, is not exempt from permit and inspection requirements even if the power source is from a permanently installed electrical receptacle.

If the plug and cord system 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.

Ugly Picture: If viewing this document online, click on the picture to open a larger image.

This was a service panel that caught fire after water damage due to a poorly sealed flashing on the service mast penetration. The contractor told the inspector water was traveling under the flashing through the roof penetration, down the outside of the conduit into the panel.

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: http://www.ElectricalCurrents.lni.wa.gov

Electrical Section Internet Address: http://www.ElectricalProgram.Lni.wa.gov/

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 & Industries is an Equal Opportunity employer.
Question of the Month – Electrical trainees are required to work under the direct supervision of a properly certified electrician working on the same jobsite. What is a jobsite and what is supervision? See correct answer on Page 2.

Automatic Notification of Inspection Results – Why Permit Email Addresses Matter

Just a few years ago, inspectors used hand written notices to post inspection results on the jobsite. More recently, we gave customers the ability to look up results online. Now, in addition to online lookup and important approval stickers affixed on jobsites, email notification of inspection results will be sent if the permit applicant has provided a valid email address on their permit application. Recently, we have been testing updates to the computer system we use to record and store inspection results. We are ready to launch near real-time inspection results. Updates to our system make it easier for inspectors to upload inspection results online through a wireless connection if they have signal. When the system receives results, it sends them out to the customer. Results include what was approved or disapproved, and corrections that were completed or written that day are listed if any.

Now, a pilot team of inspectors is using the new system, so you may get email results from some inspections, but not others. By the end of April, all inspectors will be using the new system. Thank you to the legislature, Electrical Board and our customers for supporting funding to improve our technology.

Legislative Update

As discussed in the February 2017 newsletter, the legislature has been considering several bills that may affect the electrical program. Three bills have passed the first cutoff date and will continue on for further consideration.

1. **Senate Bill 5211** – Removes the ability of the Electrical Board to hear appeals of decisions by the Office of Administrative Hearings. Decisions made by an administrative law judge would be a final order.
2. **House Bill 1855** – Requires business name and electrical contractor license number to be marked on vehicles while used in the electrical construction trade.
3. **House Bill 1952** – Allows cities that have electrical inspection jurisdictions to enforce licensing and certification provisions of RCW 19.28.

Review the bills and comment if you desire. A comment button is located to the right of the bill number on each webpage hyperlinked below. You may also contact your legislator to share your opinion about any legislation by visiting the legislative website at: [http://www.leg.wa.gov/LIC/Pages/hotline.aspx](http://www.leg.wa.gov/LIC/Pages/hotline.aspx).

Attend a Stakeholder Meeting Near You

As announced in the January 2017 newsletter, I am holding 18 electrical stakeholder meetings in various locations across the state between January 24 and April 5, 2017. These meetings are an opportunity to talk in an informal setting. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. A link to meeting dates and locations is on our Electrical Calendar webpage and will be distributed on the program email list. If you are not on the email list, you may join at our Electrical Email List webpage.

**WAC 296-46B Electrical Rule Revisions – Public Comment Period and Hearing**

The department is considering amendments to WAC 296-46B in two separate rulemaking activities. The adoption of the 2017 National Electrical Code (NEC®) is underway. The process was detailed in the August 2016 Special Edition newsletter. The first draft of the revised rules was presented to the Electrical Board at their January 26, 2017 meeting. The board

This document may contain hyperlinks to internet web pages. To access this PDF document online, go to: [http://www.ElectricalCurrents.lni.wa.gov](http://www.ElectricalCurrents.lni.wa.gov)

voted unanimously to advise the department to move forward with proposals contained in the first draft. A second draft was compiled which includes the Board’s recommendations and some minor revisions. The proposed rule was filed on February 28, 2017, and along with the second draft is posted on the Rule Development page of our website. If you would like to comment on the proposed rule you may respond formally by submitting written comment or by attending and commenting at the public hearing. Written comments may be sent to Alicia Curry: PO Box 44400, Olympia, WA 98504-4400; Alicia.Curry@Lni.wa.gov; or by fax to (360) 902-5292, by 5 p.m. on April 6, 2017. A public hearing will be held on April 6, 2017 at 9:00 a.m. at the Tumwater L&I building, 7273 Linderson Way SW, Tumwater, WA 98501. You may learn more about the proposed rule and provide informal feedback at one of the stakeholder meetings discussed above.

Another rulemaking activity involves permanent adoption of rules regarding provisions for temporary electricians and allowing a path for Canadian Red Seal Endorsed electricians to qualify for the 01 general certificate of competency exam. This was the subject of emergency rulemaking which became effective November 21, 2016 and will remain in effect until March 21, 2017 if not extended. More information about this rulemaking can be found on the Rule Development page.

**WAC 296-46B-250(8) and NEC® 250.94 Intersystem Bonding Termination Device**

The department is proposing to adopt NEC® 250.94 beginning July 1, 2017. In 2008, NEC® 250.94 was changed to require an intersystem bonding termination device to be installed at services for connection of bonding conductors for other systems such as telephone, internet, and cable TV systems. At that time, suitable devices were not available, and Washington did not adopt this requirement. Since that time, WAC 296-46B-250(8) has stated that NEC® 250.94 is not adopted. One of the proposals in the current WAC 296-46B revisions is to adopt NEC® 250.94. This will require an intersystem bonding termination device (see picture) to be installed external to enclosures at the service equipment or metering equipment enclosure and at the disconnecting means for any additional buildings or structures. These devices are fairly inexpensive (about $10) and are simple to install.

**Electrical Board Openings**

In July, there will be five seats on the Electrical Board that will be up for appointment by the Governor. Some of the seats are held by incumbents who are eligible for reappointment. The Board meets four times per year and serves a vital role in advising L&I on all matters pertaining to Washington’s electrical laws, rules, and policies. The role and membership of the Board is described in RCW 19.28.311. Seats that will be open for appointment or reappointment in July are: one representative of an electrical contractor association, one licensed professional electrical engineer who is also a registered communications distribution designer, one telecommunications worker, one outside line worker, and one certified electrician. You can submit an application or recommend an applicant using the forms on the Governor’s Boards & Commissions website. Application must be made using the Governor’s form. You may attach your resume and any additional information you would like considered at the bottom of the application before submitting. If you have any questions about completing the application, please contact Gov. Inslee’s Office by email or call 360-902-4111.

**Ugly Picture:** If viewing this document online, click on the picture to open a larger image. You may need to zoom in on this to see it, but look closely at the bolts that “secure” the 480-volt lugs to the transformer primary terminal bars. This transformer had been energized and it was supplying power to 4 mobile office trailers with computers, lights, and heat running. The inspector asked to see inside the transformer and found this. A question that comes to mind is, how did the set screws on the primary lugs get tightened? This may be a good time to bring up a new requirement in 2017 NEC® 110.14(D) which requires a calibrated torque tool to achieve the indicated torque value for electrical fasteners.

**Answer to Question of the Month:** "Job site" means a specific worksite having a single address or specific physical location (e.g., a single family residence, a building, a structure, a marina, and individual apartment building with a specific address, etc.). "Supervision" for the purpose of supervising electrical trainees, means that the appropriately certified supervising electrician is on the same job site as the trainee being supervised. For complete definitions of these terms, see WAC 296-46B-100. Lack of proper supervision not only creates potentially hazardous conditions, it is illegal and could result in civil penalties being assessed to the contractor, administrator, and trainee.
**Question of the Month** – *See correct answer on Page 2.*

An inspector writes you a correction on a job for violation of 2017 National Electrical Code (NEC®) 625.54 to provide GFCI protection for a 240-volt, single-phase, 50 ampere receptacle for an electric vehicle charger. You look in your copy of the 2017 NEC® and 625.54 is not there. How can this be? Is this a valid correction?

**Legislative Update**

If you are a part of the electrical or telecommunications industries regulated by L&I, lawmakers are considering several bills that may affect you. None of this legislation is sponsored by L&I.

Review the bills and comment if you desire. A comment button is located to the right of the bill number on each webpage hyperlinked below. You may also contact your legislator to share your opinion about any legislation by visiting the legislative website at: [http://www.leg.wa.gov/LIC/Pages/hotline.aspx](http://www.leg.wa.gov/LIC/Pages/hotline.aspx).

1. **House Bill 1430, Senate Bill 5304** – Requires the department of L&I to adopt the non-administrative portion of the electrical rules through a process in which the department, the Washington cities electrical committee, and the technical advisory committee have an equal vote in the adoption of the rules.
2. **Senate Bill 5211** – Removes the ability of the Electrical Board to hear appeals of decisions by the Office of Administrative Hearings. Decisions made by an administrative law judge would be a final order.
3. **House Bill 1855** – Requires business name and electrical contractor license number to be marked on vehicles while used in the electrical construction trade.
4. **House Bill 1871** – Effective January 1, 2022, requires electrical or plumbing certification for employees of state agencies while performing electrical or plumbing work on the premises of a state agency employer.

**Attend a Stakeholder Meeting Near You**

As announced in the **January 2017** newsletter, I am holding 18 electrical stakeholder meetings in various locations across the state between January 24 and April 5, 2017. These meetings are an opportunity to talk in an informal setting. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. A link to meeting dates and locations is on our **Electrical Calendar** webpage and will be distributed on the program email list. If you are not on the email list, you may join at our **Electrical Email List** webpage.

**Electrical Rulemaking Activities**

The department is considering amendments to **WAC 296-46B** in two separate rulemaking activities. The adoption of the 2017 NEC® is underway. The process was detailed in the **August 2016 Special Edition** newsletter. The First Draft of the revised rules was presented to the Electrical Board at their January 26, 2017 meeting. The board voted unanimously to advise the department to move forward with proposals contained in the First Draft. A Second Draft will be published shortly and will be posted on the **Rule Development** page of our website. If you would like to give feedback to the department regarding any of the proposals, you may do so informally at one of the stakeholder meetings discussed above, or you may respond formally during the public comment period or by attending and commenting at the public hearing. Details about the public comment period and public hearing will also be posted on the Rule Development page.

Another rulemaking activity involves permanent adoption of rules regarding temporary electricians and allowing a path for Canadian Red Seal Endorsed electricians to qualify for the 01 general certificate of competency exam. This was the subject of emergency rulemaking which became effective November 21, 2016 and will remain in effect until March 21, 2017 if not extended. More information about this rulemaking process can be found on the Rule Development page.
**Electrical Board Openings**

In July, there will be five seats on the Electrical Board that will be up for appointment by the Governor. Some of the seats are held by incumbents who are eligible for reappointment. The Board meets four times per year and serves a vital role in advising L&I on all matters pertaining to Washington’s electrical laws, rules, and policies. The role and membership of the Board is described in **RCW 19.28.311**. Seats that will be open for appointment or reappointment in July are: one representative of an electrical contractor association, one licensed professional electrical engineer who is also a registered communications distribution designer, one telecommunications worker, one outside line worker, and one certified electrician. You can submit an application or recommend an applicant using the forms on the Governor’s **Boards & Commissions** website. Application must be made using the Governor’s form. You may attach your resume and any additional information you would like considered at the bottom of the application before submitting. If you have any questions about completing the application, please contact Gov. Inslee’s Office by **email** or call 360-902-4111.

**2017 NEC® Preview: 210.12(C) AFCI Protection in Guest Rooms and Guest Suites**

A new provision was added to 2017 NEC® 210.12(C) to require all 120-volt, single-phase, 15- and 20-ampere branch circuits supplying outlets and devices installed in guest rooms and guest suites of hotels and motels to have arc-fault circuit interrupter (AFCI) protection by any of the means specified in 210.12(A)(1) through (6). This is a change from the previous edition in that 210.18 (210.17 in the new version) requires that guest rooms and guest suites that are provided with permanent provisions for cooking shall have branch circuits installed to meet the rules for dwelling units. That requirement is still there for 2017 but the new requirement clarifies that AFCI protection applies to all guest rooms and guest suites in hotels and motels whether they have permanent provisions for cooking or not.

**Proper Supervision of Trainees**

Appropriately certified electricians must supervise trainees learning the electrical trade. The department receives many questions about what proper supervision consists of. **RCW 19.28.161(3)** contains a definition of proper supervision: ...Supervision shall consist of a person being on the same job site and under the control of either a certified master journey level electrician, journey level electrician, master specialty electrician working in that electrician’s specialty, or specialty electrician working in that electrician’s specialty. The **WAC 296-46B-100** definition of “supervision” clarifies that the trainee is not considered to be on the same jobsite if the supervising electrician and the trainee are working: (a) In separate buildings at a single address (e.g. a campus, multi-building industrial complex, multi-building apartment complex, etc.) except for a single family residence; or (b) On an outdoor project (e.g. irrigation system, farm, street lighting, traffic signalization, etc.) where the trainee is more than 1,000 feet from the supervising electrician or where the trainee is more than 200 feet from the supervising electrician and out of sight. When the electrical work is in the scope of the 03A, 06B, 07A, 07B, 07C, 07D, 07E, or 10 specialties, the individual must be supervised 100% of the time until they get the minimum 720 or 1,000 hours of experience and pass their examination. Appropriately certified electricians must supervise trainees performing all other types of work on each jobsite for a minimum of 75% of the time the trainee works. The contractor must provide a trainee working on multiple job sites in one day with supervision for 75% of the time on each job site during the day. If an inspector finds a trainee working without supervision, but who claims to have been supervised for the required 75% time, the inspector will give the trainee an electrical trainee supervision statement to document the supervision. The trainee and supervising electrician must fill out and sign the form. The trainee is responsible to return the completed form to the inspector within 24 hours.

**Ugly Picture:** *If viewing this document online, click on the picture to open a larger image.* Look closely. Have you ever been frustrated when an inspector writes you a correction to seal all unused openings in an electrical enclosure? Yeah, me neither.

**Answer to Question of the Month:** 625.54 was added to the 2017 NEC® effective December 21, 2016 by Tentative Interim Amendment (TIA) 17-2. A TIA is an amendment to the standard after publication to correct an error or adopt an emergency revision. In addition to TIA’s, NFPA publishes Errata which correct errors in the standard after publication. To see current TIA’s and Errata, visit the **Current and Prior Editions** tab of the NFPA 70 (NEC®) web page, then mark your copy of the 2017 NEC® to reflect the changes.
### Question of the Month – See correct answer on Page 2.

According to the 2017 National Electrical Code® (NEC®), which two of the following wiring methods are permitted for the life safety branch circuit connection to a luminaire located in a T-bar ceiling 8 feet above the floor of a patient care space in a hospital? A) Type MC metal-clad cable marked “armor is grounding path component”, B) Electrical Metallic Tubing without an insulated equipment grounding conductor, C) Schedule 80 PVC conduit, D) Type MI cable with a copper outer sheath.

### Invitation to a Stakeholder Meeting Near You

As announced in the [December 2016](#) newsletter, I am holding 18 electrical stakeholder meetings in various locations across the state between January 24 and April 5, 2017. These meetings are an opportunity to talk in an informal setting. Check the schedule below and attend a meeting near you. I want to hear how we can better serve you, our customers and help you stay informed of any changes that might affect you and/or your business. Meetings are scheduled from 6 to 8 p.m. at the locations shown below. Meeting dates and addresses are also posted on our [Electrical Calendar](#) webpage and distributed on the program email list. If you are not on the email list, you may join at our [Electrical Email List](#) webpage.

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Address/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 24</td>
<td>Aberdeen – L&amp;I Building</td>
<td>415 West Wishkah Street, Suite B</td>
</tr>
<tr>
<td>January 25</td>
<td>Tumwater – L&amp;I Auditorium</td>
<td>7273 Linderson Way Southwest</td>
</tr>
<tr>
<td>February 7</td>
<td>Longview – Cowitz PUD</td>
<td>meeting room, 961 12th Avenue</td>
</tr>
<tr>
<td>February 8</td>
<td>White Salmon – White Salmon Valley Community Library</td>
<td>77 NE Wauna Avenue</td>
</tr>
<tr>
<td>February 9</td>
<td>Vancouver – L&amp;I Building</td>
<td>312 Southeast Stonemill Drive</td>
</tr>
<tr>
<td>February 21</td>
<td>Bremerton – L&amp;I Building,</td>
<td>basement, 500 Pacific Avenue</td>
</tr>
<tr>
<td>March 7</td>
<td>Mount Vernon – Northwestern Washington Research and Extension Center</td>
<td>16650 State Route 536</td>
</tr>
<tr>
<td>March 8</td>
<td>Everett – Snohomish County PUD</td>
<td>Commission Meeting Room 2320 California Street</td>
</tr>
<tr>
<td>March 9</td>
<td>Tukwila – L&amp;I Building</td>
<td>12806 Gateway Drive South</td>
</tr>
<tr>
<td>March 21</td>
<td>Pullman – Gladish Community and Cultural Center, Oscars Room, 115 NW State St.</td>
<td></td>
</tr>
<tr>
<td>March 22</td>
<td>Spokane – Spokane Falls Community College</td>
<td>3410 W. Fort George Wright Drive, Bldg 17, Sub Lounges A &amp; B</td>
</tr>
<tr>
<td>March 23</td>
<td>Moses Lake – L&amp;I Building</td>
<td>3001 West Broadway Avenue</td>
</tr>
<tr>
<td>March 29</td>
<td>Wenatchee – Chelan County PUD</td>
<td>Auditorium, 327 N Wenatchee Avenue – Parking in back (east) side of building</td>
</tr>
<tr>
<td>March 30</td>
<td>Okanogan – Okanogan PUD</td>
<td>Auditorium 1331 2nd Ave North</td>
</tr>
<tr>
<td>April 4</td>
<td>Kennewick – Benton PUD</td>
<td>Auditorium 2721 West 10th Avenue</td>
</tr>
<tr>
<td>April 5</td>
<td>Yakima – Pacific Power Auditorium</td>
<td>500 Keys Road</td>
</tr>
</tbody>
</table>