



ELECTRICAL CURRENTS

Newsletter from the Office of the Chief Electrical Inspector

Ron Fuller, Chief Electrical Inspector

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● Upcoming Electrical Stakeholders Meetings

Stakeholder meetings will run from September through June 2008 at locations throughout the state. *Electrical Currents* will list future meeting locations and times. It is important for you to stay up to date with changes that might affect you. Attending stakeholder meetings gives you an opportunity to get your questions answered and give the Electrical Program your input. Please join us at a stakeholder meeting.

Parking passes are required for the meeting in Spokane. Pick up a parking pass at the L&I Spokane office or go to:

<http://www.lni.wa.gov/tradeslicensing/electrical/whatsnew/calendar/default.asp>

Safety Tip of the Month!



Scrutinize the product, the packaging and the labeling. Look for a certification mark from an independent testing lab. Trademarked logos that look unusual may signal a counterfeit.

Meeting Locations

September 24	Douglas County PUD No.1 1151 Valley Mall Parkway East Wenatchee	October 17	L&I Bldg. Auditorium 7273 Linderson Way SW Tumwater
September 25	Spokane Community College Lair Building, Sasquatch Room Spokane	October 18	L&I Bldg. 415 W. Wishkah, Suite 1B Aberdeen
September 26	City of Pullman offices 325 SE Paradise St. Pullman	October 24	Snohomish County PUD 2320 California Street Everett
October 10	Benton PUD 2721 West 10th Kennewick	November 14	The Orcas Room, 5 th floor 950 Broadway Bldg. Tacoma

● What About HVAC/R?

This *Electrical Currents* will clarify the HVAC/R scopes of work, licensing, certification, and permitting. The HVAC/R industry has two specific specialties, the:

- 06A – HVAC/refrigeration; and
- 06B – HVAC/refrigeration restricted.

If you want to do work that is not allowed for these specialties, you may need to get a combination or general electrical license. Many HVAC/R people also have 07 – Nonresidential Maintenance and/or 06 – Limited Energy licenses.

There have been many *Electrical Currents* articles written about the HVAC/R industry. To get past issues, go to: <http://www.lni.wa.gov/TradesLicensing/Electrical/FormPub/default.asp>

● HVAC/R Grandfathering & Open Window

Many opportunities to apply previous HVAC/R work experience towards qualifying for electrician and administrator certificates were available from 1999, to 2004. Those opportunities are no longer available.

All experience must now meet the requirements of the electrical law, Chapter 19.28 RCW. If you applied for and gained credit for experience during the open window periods, you still have that experience credited to you. Use it to re-qualify for the HVAC/R exam.

You can get copies of the electrical laws or rules at any L&I office for \$5 each or go to: <http://www.lni.wa.gov/TradesLicensing/Electrical/LawRulePol/default.asp>

● HVAC/R Electrician Certification & Trainees

If you work on electrical wiring or equipment, you must be a certified electrician or a supervised electrical trainee. Electricians are restricted to the scope of work allowed for their certificate. Penalties for not having valid electrician certification begin at \$250 per violation.

Trainee certificate	Application (\$35)	Valid for 2-years	Renewal (\$43, experience affidavit, & 16 hours of approved classroom education)
06A – HVAC/R electrician certificate	Application (\$72, 4,000 hours of verified on-the-job experience & pass exam)	Valid for 3-years	Renewal (\$67 & 24 hours of approved continuing education)
06B – HVAC/R restricted electrician certificate	Application (\$72, 2,000 hours of verified on-the-job experience & pass exam)	Valid for 3-years	Renewal (\$67 & 24 hours of approved continuing education)

06A training experience can be applied towards qualifying for the 01 – General Journeyman certificate. 06B training experience can only be applied towards qualifying for the 06A – HVAC/R certificate. To get training experience you must work under a valid training certificate.

Normally, trainees must work under supervision. Trainees can install thermostat cable when the HVAC/R system is a single thermostat in a single or two-family dwelling and the line voltage power has not been connected to the dwelling service.

For the 06A and 06B specialties, the ratio of supervision is one appropriately certified electrician for up to two trainees. The supervising electrician must be present for:

- At least 75% of the day for a 06A trainee; or
- 100% of the day for a 06B trainee.

An electrical trainee with 1,000 hours of 06B verified on-the-job experience may qualify to take the 06B exam early, and work without supervision until the required 2,000 hours of on-the-job experience have been gained.

To be eligible, the trainee must apply (\$64), be approved, and pass the 06B exam. When the required hours have been achieved, the trainee must submit an application to become a 06B electrician. If the trainee has not gained the required 06B hours before the 0% supervision training certificate has expired, the trainee may apply for a 75% supervision training certificate (\$43).

For more information about exams or becoming an electrician or trainee, call (360) 902-5269 or go to: <http://www.lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/LicenseCert/default.asp>

● Electrical Contractor Licensing & Electrical Administrators

You must be a licensed electrical contractor if you advertise, bid or are in the business of installing electrical wiring or equipment. Being a certified electrician does not allow a person to be an electrical contractor. Penalties for a violation of the electrical contractor licensing law begin at \$500 per violation.

To become an electrical contractor, you must apply to L&I. Your application includes: the application fee (\$221), an assigned electrical administrator application (\$35), and a \$4,000 bond or surety.

An administrator is responsible to ensure the electrical contractor and the contractor's electricians follow the electrical law's requirements (see RCW 19.28.061(5)). An administrator may only be assigned to one contractor at a time. The assigned administrator must be a full-time supervisory employee. A contractor can only have one assigned administrator, but may employ other unassigned administrators.

To become an electrical administrator, you must take the exam for the specialty you want to administrate. No pre-qualification is necessary to take an administrator exam. After passing the administrator exam, you must apply within 90 days to become an administrator (\$100).

For more information about exams or becoming an electrical contractor or administrator call (360) 902-5269 or go to: <http://www.lni.wa.gov/TradesLicensing/Electrical/LicenseExamEd/LicenseCert/default.asp>

● HVAC/R Definitions

Specific HVAC/R definitions are included in WAC 296-46B-100(34). "HVAC/refrigeration system" means a system of HVAC/refrigeration: Wiring, equipment, and components integrated to generate, deliver, or control heated, cooled...air. This definition excludes non-HVAC/refrigeration control systems (e.g. fire alarm systems, intercom systems, building energy management systems, and similar non-HVAC/refrigeration systems)."

Dampers, actuators, control valves, motors, temperature sensors, HVAC/R unit equipment and other devices may be a part of an HVAC/R system if they are dedicated to the function of the HVAC/R system and serve no other purpose.

WAC 296-46B-920, Figures 920-1 and 920-2, help clarify what is in a HVAC/R system.

● HVAC/R Scopes of Work

WAC 296-46B-920(2)(f)'s scope of work description for the 06A and 06B HVAC/R specialties is divided into three sections: general, 06A, and 06B. The general section applies to both specialties. These specialties allow the HVAC/R industry to do a broad scope of electrical work. Most HVAC/R contractors and electricians do not perform all parts of their allowed scope of work. All specialty exams include questions about the complete allowed scope of work, not just what the contractor or electrician does on a day-to-day basis. The highlights of the HVAC/R scopes of work are bulleted below. For specific scope of work details go to WAC 296-46B-920.

● General HVAC/R Scope of Work

The general HVAC/R scope of work section includes WAC 296-46B-920-(2)(f)(i) through (iv). This section contains: a reference to the definitions, a clarification for HVAC/R that allows a manufacturer's recommended replacement part to be considered like-in-kind for replacement purposes, and descriptions of what is and is not allowed for both specialties. **"Work on" means:** install, repair, replace, or maintain.

Both HVAC/R specialties may work on:

- HVAC/R low voltage controls in all types of residential occupancies. There is no floor limitation for residential so long as the work is inside the residence and not in a public area (e.g. inside a condominium of a high-rise building, but not the public areas);
- Line voltage components inside any HVAC/R equipment or the internal components of an HVAC/R disconnecting means so long as it is not in a panelboard or motor control center;
- Short lengths of raceway used to physically protect low voltage cables, and may repair, replace, or maintain existing line voltage supply whips not over 6' long where the circuit characteristics are not being changed. When replacing a supply whip, you may change the type of raceway (e.g. metal flex to non-metallic flex).

HVAC/R specialty may not:

- Install or replace a controller or disconnect switch that is external to the HVAC/R equipment;
- Work on integrated building control systems that are not exclusively for HVAC/R equipment;
- Work on single stand-alone line voltage equipment (e.g. baseboard heaters, radiant panels) or it's components unless: it is exclusively controlled by an HVAC/R system and has a connection to a mechanical system (e.g. ducting, piping), or contains a HVAC/R mechanical system (e.g. wall air-conditioner);
- Work on light fixtures that serve as a building lighting source;
- Work on any type of raceway/conduit systems (i.e. from one enclosure to another except for the supply whip);
- Work on line voltage service, feeder, or branch circuit conductors. If the feeder/branch circuit supplies a HVAC/R equipment that contains supplementary overcurrent devices both specialties may work on the conductors from the supplementary overcurrent protection to the supplementary HVAC/R equipment if the equipment and supplementary overcurrent protection are with sight of each other (see Figure 920-2);
- Work on any panelboard, switchboard, or MCC external to the HVAC/R system.

● Specific 06A HVAC/R Scope of Work

The 06A specialty is not limited by voltage, phase, or amperage. Unsupervised 06A trainees may not work on any HVAC/R equipment or system rated over 600 volts whether the circuit is "ON" or "OFF."

The 06A specialty may:

- Install HVAC/R low voltage control systems in non-residential occupancies:
 - When the building is limited to three stories or less above grade (basements and roofs are not considered stories);
 - All the following apply regardless of the number of stories where the HVAC/R wiring:
 - Does not pass between stories;
 - Is in a previously occupied and wired space (i.e. tenant improvement); and
 - Is restricted to the HVAC/R system.
- Repair, replace, or maintain HVAC/R low voltage control wiring and equipment regardless of the number of floors;
- Work on a bonding conductor for metal gas piping to an existing grounding electrode system when the connection can be made external to other electrical equipment.

The 06A specialty may not work on any wiring outside the HVAC/R equipment in a classified location.

● Specific 06B HVAC/R Scope of Work

The 06B specialty is limited to HVAC/R systems not exceeding 250 volts, single phase, 120 amperes.

The 06B specialty may work on HVAC/R low voltage control systems in non-residential occupancies that have no more than three stories above grade.

The 06B specialty may not work on:

- HVAC/R low voltage wiring or equipment installed in a raceway; or
- On any HVAC/R wiring or equipment installed in a classified location.

● Permitting HVAC/R Work

Except for Class A work, all the work done by an HVAC/R contractor must be permitted by the contractor actually doing the work using either a normal electrical permit or a Class B label. Some HVAC/R type Class A items include: fuses, control components, thermostats, heating element, and motors smaller than 10 H.P. Go to WAC 296-46B-900(8)(b) to see a complete list of non-permitted items. The contractor doing the electrical work cannot ask another electrical contractor "to cover" their work with a permit. Penalties for permit violations begin at \$250.

The HVAC/R contractor may always elect to buy a normal electrical permit, but this may be more expensive than using a Class B label. Class B labels are an inexpensive (\$10) alternative for many types of HVAC/R installations.

Examples of HVAC/R type Class B work include:

- Thermostats;
- Motors larger than 10 hp;
- Wiring internal to a HVAC/R equipment;
- Like-in-kind replacement of an electric, gas, or oil furnace not exceeding 250 volts, 100 amps where the furnace is connected to an existing circuit;
- Like-in-kind replacement of an air conditioner/heat pump not exceeding 250 volts, 30 amps when the unit is connected to an existing circuit; and
- The repair or replacement of low voltage HVAC/R control wiring

Class B labels cannot be used in classified areas or areas regulated by NEC 517 or 680.

Class B labels are only available to electrical contractors and approved large commercial and industrial customers. The Class B label must be posted on the panelboard supplying power to the equipment or on the HVAC/R equipment itself before beginning any work. The electrician doing the work must accurately and completely fill out the label. Class B labels cannot be filled out by anyone other than the actual installer on the job. The contractor must return the contractor portion of the label to L&I within 15 working days after beginning the work. Class B labels are not refundable or transferable to another contractor.

Class B label are inspected on a random basis. L&I will use the information on the returned label to arrange the inspection with the owner. It is imperative that the information on the label be accurate.

If a correction is written on a Class B label, a fee (\$35) will be charged to do the required reinspection and another Class B label will be inspected.

Go to WAC 296-46B-900(20) through (26) for full details on Class B label and how to use them. If you use a Class B label, fill them out completely and accurately and mail them to L&I as required.

● HVAC/R Summary

It is your responsibility to know and follow the electrical laws. If you need to get training, there are many associations, training facilities, and education providers available to help you. Do not hesitate to seek help if you are unsure. Get training or call any L&I office if you have specific licensing, certification, permitting, or code questions. We cannot design your work, but we will offer any help possible.

● Question of the Month

This Month's Question: The connection of a low voltage HVAC/R low voltage control system to a building's energy management system may be done by a HVAC/R specialty. True? False?

The August answer was: C) 382 amps [$137,500 \text{ VA} \div (208 \text{ V} \times 1.732_{\text{[square root of 3]}}) = 382 \text{ A}$]
[Hint: 3Ø voltage convention on our exams is $208 \text{ V}(3\text{Ø})=360 \text{ V}$; $240 \text{ V}(3\text{Ø})=416 \text{ V}$, $480 \text{ V}(3\text{Ø})=831 \text{ V}$]

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