



## Electrical code issues and answers.

### ● Happy Holidays to One and All

Another year has come and gone as the department continues to join with its electrical stakeholders to “Keep Washington Safe.” As we continue our partnership into the new millennium, the department will remain focused on public safety and customer service.

We have implemented new technology and the New Year promises even more customer friendly innovations. Customers can now request inspections over the Internet, and soon contractors will be able to access the results of inspection over the Internet. The department is also looking at the possibility of contractors being able to purchase permits via the Internet.

This is the end of the second year of the Electrical Currents Newsletter that we began in January of 1998. It has been a very useful tool to communicate clearly with customers and provide clear code interpretations for both contractors and inspectors.

Best wishes for a safe and happy holiday season from Janet Lewis, Chief Electrical Inspector and Technical Specialists, Ron Fuller, Gary Gooler, and Mike Vert.

● **Upcoming Electrical Stakeholders Meeting -- December 13, 1999 / 7:00 PM to 9:00 PM**  
This is your chance for input! You can also receive **4 CEU** credits for attending the meeting and satisfactorily completing the take home exam that will be available at the meeting.

Where: Department of Labor and Industries  
Tukwila Service Location, (206) 248-6630  
12806 Gateway Drive  
Tukwila, WA

### ● Can a Sign Disconnecting Means be located on the Inside of a Sign?

A sign's disconnect may be located on the inside of the sign if the operator is not exposed to live parts when operating the disconnect. NEC 600-6 establishes that signs and outline lighting systems “...shall be controlled by an externally operable switch or circuit breaker...” and Article 100 defines externally operable as: “Capable of being operated without exposing the operator to contact with live parts.” NEC 600-6(a) says the switch or circuit breaker must be “...within sight of the sign or system controlled or, when the external disconnect is located out of sight of the sign, it must “...be capable of being locked in the open position.”

The department has been inspecting many electric signs where the cover must be opened or dismantled to reach the sign disconnect. When inspecting signs with the disconnect switch inside the cover, the inspector must have access to verify compliance with Article 600. This may mean the installer must provide means (e.g. a bucket truck or extension ladder) for access. There are some signs where the sign operator is not exposed to live parts when accessing an internal switch (i.e. a sign with completely enclosed internal lighting fixtures). Because of exposure to open electrical terminals, lamp sockets, and etc., most sign installations require the sign disconnect to be located outside the sign enclosure.

### ● Requirements For Generator Grounding Electrode

With the large number of generators being installed at this time please keep the requirements of NEC 700-8(b), 701-9(b), 702-8(b) in mind. These articles require a sign or plaque at the point of the connection between the grounding electrode, the normal system grounded conductor (neutral), and the emergency system grounded conductor. The sign must identify all emergency and normal sources connected to the grounding electrode. This is required in a majority of generator installations because the neutral is usually solidly connected at the transfer equipment (see NEC 100 definitions) and is not a separately derived system.

If a problem develops in the normal panel (the location where both the normal and emergency systems connect to the grounding electrode conductor), resulting in a loss of normal power, care must be taken to not remove the grounding electrode conductor, main bonding jumper, grounded conductor, or the equipment grounding conductor

connections at the main panel. The required sign plays an important role in notifying the person making the repairs that a potential problem exists. An unsafe condition (ungrounded system) will be created if these connections were to be removed.

### ● **Top Ten Corrections**

In October the department compiled a list of the top ten most often written National Electrical Code violations in Washington. The code article that topped the list was NEC 110-3. The Revised Code of Washington, RCW 19.28.010, requires all materials, devices, appliances, and equipment used in electrical installations to conform to applicable standards or be indicated as acceptable by the established standards of an electrical product testing laboratory accredited by the department. NEC 110-3(a) describes considerations that must be taken into account when judging the suitability of equipment. Listing and labeling is a very common method used to identify products suitable for specific applications, purposes, or environments. NEC 110-3(b) requires listed and labeled equipment to be installed and used in accordance with any manufacturer's instructions included in the listing and labeling. It is very important for electricians and inspectors to be sure electrical equipment is installed and used for the purpose it was designed and manufactured.

### ● **NEW POLICY – 99-16 – Scope of Work for Limited Energy System (06) Specialty Contractors and Electricians**

A new policy has been developed to address confusion over the licensing requirements for limited energy systems. Policy 99-16 has been developed and was approved by the Electrical Board at their last meeting to clarify the definition of the scope of work for limited energy (06) contractors and installers. Please refer to the October, 1999 issue of the Electrical Currents for further clarification of limited energy and low voltage wiring issues.

Policy 99-16 says:

“The definition of the (06) specialty contractor is found in WAC 296-46-930 and the definition of the (06) specialty electrician is found in WAC 296-401A-140. Both sections limit this specialty to:

...the installation of signaling and power limited circuits and related equipment. This specialty includes the installation of fire protection signaling systems, intrusion alarms, non-utility owned communications systems, and such similar low energy circuits and equipment.

The intent of the Electrical Board and the department when the (06) Limited Energy System was established was to restrict the (06) specialty to installations of “low energy circuits and equipment.” This specialty is restricted to Class 1 power-limited circuits (30 volts maximum), Class 2 circuits (30 volts maximum) and Class 3 circuits (up to 100 volts maximum).

***This specialty cannot install line voltage (110 volts to 600 volts) Class 1 non-power limited remote control and signaling circuits or other line voltage branch circuits or feeders.*** A contractor must hold a general electrical license (01) and employ certified (01) journeymen to install line voltage, Class 1 non-power limited remote control or signaling circuits or other related branch circuits or feeders. This specialty can replace line voltage like-for-like components in HVAC/Refrigeration equipment consistent with the limitations of the new HVAC/R (06A) limited energy specialty.”

### ● **When Are Ground Rods Required?**

There has been some confusion regarding the requirements for ground rods (made electrodes). There are only two instances where ground rods, or other made electrodes, may be required:

- (1) Supplementary protection for underground metal water pipe: When metal underground water pipe is used as an electrode (NEC 250-50 (a)) it must be supplemented by another electrode (NEC 250-50 (a) (2)). The supplemental electrode can be any other electrode on the premise including or excluding ground rods. An example would be when both a water pipe electrode as provided in NEC 250-50 (a) and a building steel electrode as provided in NEC 250-50 (b), exist together on a premise. In this case “made and other electrodes”, including ground rods, are not required.
- (2) No existing grounding electrode: When no grounding electrode exists, a made electrode such as ground rods must be installed. Examples of installations that require a made electrode include a temporary service, a non-metallic structure with non-metallic underground water pipe, or other structure(s) where a grounding electrode does not exist.