

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) Sigh 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-000](#) 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-0000](#) definition of "identification plate") that is substantially red in color with letters at least 1 inch high.

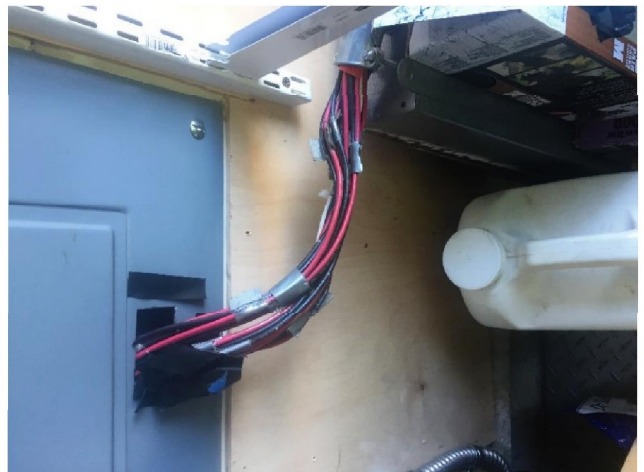
The emergency shutoff device(s) must disconnect power to all dispensing devices, to all remote pumps serving the dispensing devices, to all associated power, control, and signal circuits, and to all other electrical equipment in the hazardous (classified) locations surrounding the fuel dispensing devices. 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.



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

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

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