

Chapter 19 Electrical Safety

References

1. SPPM 2.72 Electrical Safety
 - a. [2.72 Electrical Safety | PR&F site | Washington State University \(wsu.edu\)](#)
2. SPPM 2.50 Self-Inspection
 - a. [2.50 Self-Inspection | PR&F site | Washington State University \(wsu.edu\)](#)
3. SPPM 8.50 Space Heaters
 - a. [8.50 Space Heaters | PR&F site | Washington State University \(wsu.edu\)](#)
4. L&I Electrical Laws and Rules
 - a. [Electrical Laws, Rules & Policies \(wa.gov\)](#)
5. WAC 296-46B-999 Electrical Testing Laboratory Requirements
 - a. <https://app.leg.wa.gov/WAC/default.aspx?cite=296-46B-999>
6. WAC 296-46B-903 Electrical Equipment Standards
 - a. <https://app.leg.wa.gov/wac/default.aspx?cite=296-46B-903>
7. WAC 296-803 Lock-Out/Tag-Out (Control of Hazardous Energy)
 - a. <https://app.leg.wa.gov/wac/default.aspx?cite=296-803>
8. WAC 296-45-325 Working on or near exposed electrical parts
 - a. <https://app.leg.wa.gov/wac/default.aspx?cite=296-45-325>

B. Purpose. This chapter establishes electrical safety standards synonymous with Washington Administrative Code, standards of Washington State Department of Labor & Industries, as well as WSU's Safety Policies and Procedures Manual.

Washington Administrative Code addresses electrical testing laboratory requirements as well as electrical equipment standards. L&I provides easy access to ruling standards resources for electrical safety in the workplace. WSU SPPM supplies resources for reporting accidental injuries related to electrical hazards, how to initiate an investigation into electrical hazards, and the regulations for operating a space heater on campus.

C. Scope. This chapter applies to all personnel who encounter and interact with electrical devices and systems, as well as those who use or would like to use a space heater in the workplace.

D. Responsibilities.

Employer's:

- University supervisors and supervising faculty are to ensure that work and learning/research areas are free from electrical shock and overload (i.e., fire) hazards.
- Departments are responsible for ensuring that all equipment wired to building circuits or connected by power plug to building sockets/outlets is compliant with National Electrical Code (NEC) provisions. To ensure compliance, equipment must be:
 - Listed by Underwriters Laboratory (UL); or
 - Listed by a nationally recognized, accredited testing laboratory; or
 - Inspected and approved by the authority having jurisdiction over the NEC provisions.
- Immediately remove a hazardous or malfunctioning electrical equipment item from service. Prevent use of the hazardous or malfunctioning item by installing barriers,

removing the power source, removing the equipment item, or locking the item out. Affix an “Out of Service” tag to the equipment item.

- Obtain the services of a qualified electrician to correct hazardous or malfunctioning electrical equipment.
- As part of the annual safety self-inspection, unit administrators and supervisors are to check the work or learning/research area for electrical hazards. See [SPPM 2.50](#) for self-inspection procedures.
- Supervisors and faculty are responsible for training employees and students to safely use electrical equipment. This training is to be part of the safety orientation (see [SPPM 2.16](#)).

Employee's:

- Report hazards directly to the supervisor or complete and submit a Hazard Notification form (see [SPPM 2.52](#)) to the unit safety committee, unit administrator, and EH&S.
- Immediately discontinue the use of hazardous electrical tools or appliances.
- Do not use electrical equipment which has been determined to be unsafe.
- Do not attempt to repair electrical equipment unless qualified.
- All personnel using electrical equipment are to know the locations of the branch circuit panels that may be accessed in an emergency.

E. Electrical Safety

- Building Circuits and Wiring
 - Refer concerns, problems, and questions related to electrical circuits and wiring in University buildings to the unit responsible for buildings at the affected campus. Departments at the WSU Pullman campus contact Facilities Services, Operations; telephone 509-335-9000.
 - Only authorized and qualified personnel are permitted to work on building circuits and wiring.
 - Main Distribution Panels
 - Main distribution panels control electricity after it enters the building and before it goes to branch circuit panels. These panels are typically located in locked electrical closets or mechanical rooms, in areas inaccessible to untrained personnel.
 - Only trained Facilities Services, Operations and Housing Maintenance personnel and approved electrical contractors may access University main distribution electrical panels. These personnel receive arc flash protection training.
 - Branch Circuit Panels
 - Access:
 - Departmental personnel may access branch circuit breaker panels to turn off electricity in an emergency or to reset branch circuits. If a branch circuit requires setting more than once, notify the unit responsible for buildings at the affected campus. Departments at the WSU Pullman campus are to notify Facilities Services, Operations; telephone 509-335-9000.
 - Precautions:

- Circuit breakers are to be labeled to identify the equipment and/or circuits that the breakers control. If a circuit breaker is not labeled, notify the unit responsible for buildings at the affected campus. Departments at the WSU Pullman campus are to notify Facilities Services, Operations (telephone 509-335-9000).
- Keep at least three feet of clear working space in front of a branch circuit panel. Do not store materials in this working space.
- Branch circuit servicing receptacles located within six feet of a water source (e.g., sink) must be equipped with ground fault circuit interrupters (GFCIs). The GFCI may be installed at the receptacle or at the breaker/branch circuit panel. Departments at all campuses are to contact Environmental Health and Safety (EH&S) to evaluate the need for and the installation of GFCIs.
- Branch circuit outlet receptacles located in wet or damp locations are to be weatherproof.
- Portable Cord- and Plug-Connected Equipment and Extension Cords
 - Portable cord- and plug-connected equipment and extension cords are to be free of the following:
 - Loose parts
 - Deformed or missing pins
 - Damage to the outer covering or insulation
 - Portable cord- and plug connections equipment and extension cords may be repaired or spliced only if the insulation and outer sheath properties are retained. Job-made extension cords, i.e., extension cords built by an employee at the work site, are prohibited unless made by an electrician using approved UL (Underwriters Laboratories) components.
 - Portable extension cords servicing equipment within six feet of a water source or used open to the weather must be equipped with GFCIs.
 - Use an extension cord which is the appropriate gauge, i.e., wire thickness, for the intended application.
 - Department personnel are prohibited from:
 - Using extension cords as a substitute for fixed wiring in a structure.
 - Running extension cords through holes in the wall, ceilings, or floors.
 - Running extension cords through doorways and windows.
 - Attaching extension cords to building surfaces.
 - Concealing extension cords behind building walls, ceilings, or floors.
 - Fastening or hanging extension cords in any way that could cause damage to the outer covers or insulation.
 - Extension cords may be used on a temporary basis (not exceeding 60 days) for:
 - Remodeling, maintenance, repair, or demolition work.

- Experimental or developmental work.
 - Christmas decorative lighting (see [SPPM 8.70](#)).
- Outlet Adapters and Strips
 - Do not use outlet adapters, i.e, equipment items that convert single outlets into a multiple outlet. If additional outlets are needed, use breaker-protected multiple outlet strips. Do not plug one breaker protected strip into another aka “daisy chain.” If additional outlets are required, notify the unit responsible for buildings at the affected campus. Departments at the WSU Pullman campus are to notify Facilities Services, Operations (telephone 509-335-9000).

F. Self-Inspection

- The unit administrator is responsible for ensuring that an annual safety inspection is conducted to identify and control workplace hazards.
- The unit supervisor, with the assistance of the unit safety committee, is responsible for conducting annual safety inspections for her or his area.
- Safety inspections are to be conducted at least annually. However, high-hazard areas, i.e., workshops and laboratories, should be inspected more frequently.
- Inspection Checklist
 - Use the Safety Inspection Checklist as a guide to conduct safety inspections. Complete and/or print the master to obtain copies of the checklist.
 - Other sources which can be consulted or utilized in conducting safety inspections include:
 - Suggestions and Hazard Notification forms submitted by employees.
 - Reports of accidents and near misses that occurred in the unit during the last year.
 - Department of Environmental Health and Safety (EH&S)
 - Fire Marshal, Department of Public Safety
- Inspection Results
 - Enter the inspection results on the Safety Inspection Checklist.
 - Forward the completed Safety Inspection Checklist to the unit administrator for review. The unit administrator initiates action to address any safety deficiencies noted on the worksheet.
 - Safety inspection results should be reviewed and discussed at the next scheduled safety committee or foreman/crew meeting. The safety committee may recommend action to address any safety deficiencies.
- Inspection Follow-Up
 - The unit administrator ensures that the noted safety deficiencies are addressed. The unit administrator logs a description on the Safety Inspection Checklist of the action initiated for each noted item.
 - The unit retains the completed Safety Inspection Checklist and forwards a copy to EH&S; mail code 1172.
- Assistance
 - Contact Environmental Health and Safety; telephone 509-335-3041; for:
 - Clarification of inspection items.
 - Assistance in conducting inspections.

- Assistance with developing plans to correct deficient items which are not under the control or responsibility of the unit.
- Contact the Fire Safety Officer, Department of Public Safety, for assistance with fire safety inspection items; telephone 509-335-3041.

G. Space Heaters

- The WSU Fire Safety Officer and Facilities Services, Operations discourage the use of portable space heaters in University interior locations for the following reasons:
 - As sources of ignition, space heaters can create fire hazards.
 - Space heaters are not as energy efficient as central heating. (See also [BPPM 80.85.](#))
 - The electric cord creates a tripping hazard.
- Exceptions
 - University personnel may use portable space heaters if central heating is inadequate, nonexistent, or temporarily out-of-order. The WSU Fire Safety Officer has approved the following four types of space heaters for emergency use by University departments.
 - To conserve energy, the Facilities Services, Operations Energy Group recommends that University personnel select portable space heaters that use 200 watts or less of electricity. For safety purposes, the space heaters must have on/off switches and be UL (Underwriters Laboratory) listed.
- Oil-Filled
 - A non-combusting electric oil-filled heater that distributes heat primarily by natural convection currents and low temperature radiation. Its appearance is like an old steam radiator. It is usually 2 to 2 1/2 feet tall and uses 1500 watts of electricity.
- Water/Antifreeze-Filled
 - An electric water or antifreeze-filled heater that distributes heat by natural convection currents and low temperature radiation. This heater is long and low, looking like a baseboard heater. It uses 1500 watts of electricity.
- Panel
 - An electric low-wattage heater that distributes heat by low-temperature radiation to a localized area. It is usually a thin panel mounted to a vertical surface, e.g., a desk. It uses 200 watts of electricity.
- Ceramic Element
 - An electric heater with a fan having a **ceramic heating element** that distributes heat by forced air convection. This heater is usually shaped like a small cube, about seven or eight inches on each side. It uses 1500 watts of electricity.
- Purchasing Information
 - Contact the Facilities Services, Operations Energy Group for information regarding purchasing approved space heaters.
- Prohibited Heaters
 - Do not use the following types of space heaters in University buildings.
 - Electric Radiant
 - An electric heater with electric elements that glow bright red or orange. This heater distributes energy as high radiant heat and uses 1500 watts or more of electricity.

- Fuel-Burning
 - A heater that burns fossil fuels or alcohol.
- Heater Use
 - Avoid placing space heaters close to building thermostats.