

SOUTHERN METHODIST UNIVERSITY

OFFICE OF RISK MANAGEMENT

ELECTRICAL SAFETY PROCEDURE

INTRODUCTION:

Electricity has become an essential part of our everyday life. It is used to power research equipment, office equipment, heating and cooling equipment, etc. Electricity can be dangerous, causing shocks, fires, explosions, or burns. Accidents involving electricity may cause minor injury or may result in serious disabling injuries or death. Electricity must be recognized and respected as a serious workplace hazard.

Most injuries involving electricity could have been prevented if unsafe equipment had been taken out of service or if unsafe work areas and work practices did not exist. To minimize the risk of injury from electrical sources, it is necessary to assure that electrical "sources" are properly insulated and grounded, that circuit-protecting devices are utilized, and that safe work practices are followed.

The University will use NIOSH Standards 1910.331 through .335 in the development of this requirement. It applies to University employees both qualified and unqualified who work on, near, or with electrical circuits, except where qualified employees are excluded.

PROCEDURES:

The required training and work procedures include but are not limited to:

1. De-energized parts
2. Verification of de-energization
3. Re-energization
4. Distinguish live parts from other parts
5. Work on or near overhead power lines
6. Portable ladders
7. Conductive apparel
8. Housekeeping duties
9. Electrical safety interlocks
10. Lockout/tagout
11. Cord and plug connected equipment
12. Eye and face protection
13. Safe clearance distances for voltages, and
14. Insulated tools.

RESPONSIBILITY:

Each department is responsible for complying with this section.

Electrical safety-related work practices apply to:

Qualified persons - those familiar with the construction and operation of electrical equipment, and the hazards involved and who have training in avoiding the electrical hazards of working on or near energized parts;

Unqualified persons - those with little or no such training working on, near or with the following installations:

- Premises Wiring: Installations of electric conductors and equipment within or on buildings or other structures, and on other premises such as yards, parking lots, other lots, and industrial substations.
- Wiring for connection to supply: Installations of conductors that connect to the supply of electricity.
- Other Wiring: Installations of other outside conductors on the premises.
- Optical Fiber Cable: Installation of optical fiber cable where such are made along with electric conductors.

Other work covered by unqualified persons includes work on, near or with:

- Generation, transmission, and distribution installations
- Communications installations
- Installations in vehicles
- Railway installations

Excluded work by qualified person includes work on or directly associated with the following installations:

- Generation, transmission and distribution installations for the generation, control, transformation, transmission, and distribution of electric energy (including communication and metering) located in buildings used for such purposes, or located outdoors.

Note 1: Included in this practice is work on or directly with installation of utilization equipment that is not an integral part of a generating installation

Note 2: Work on or directly with generation, transmission, or distribution installations includes:

- a) Repairing overhead or underground distribution lines or repairing a feed-water pump for the boiler, in a generating plant.
- b) Line-clearance, tree trimming and replacing utility poles.
- c) Work on electric utilization circuits in a generating plant provided that:
 - Such circuits are co-mingled with installations of power generating equipment or circuits; and
 - The generation equipment or circuits present greater electrical hazards than those posed by the utilization equipment or circuits (such as exposure to higher voltages or lack of over current protection).
- OSHA 29CFR 1910.268 covers telecommunication communication installations.
- Installations in vehicles include: ships, watercraft, railway rolling stock, aircraft, or automotive vehicles other than mobile home and recreational vehicles.
- Railway installations for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations of railways used exclusively for signaling and communication purposes.

SAFE WORKING PRACTICES:

1. Electrical cords must be inspected for frays, cracks, exposed wires, and to ensure that the insulating jacket is intact. Check the plug and cord for defects, and replace or repair prior to further use.

2. Electrical cords must not come in contact with heat sources such as pipes or radiators, hazardous substances, or sharp objects and must not be run through water.
3. Equipment must not be placed where the electrical connection could be hit, tripped over, or walked on.
4. Extension cords shall not be used as a permanent source of wiring.
5. Electrical utility rooms containing circuit breakers shall not be blocked with equipment, clutter, etc. Equipment/articles should not be placed within three feet of a circuit breaker.
6. Employees should know the location of circuit breakers in their work area.
7. Circuit breaker switches must be identified as to the equipment controlled.
8. Multi-plug adaptors (inclusive of extension cords, cube adaptors, and strip plugs) must meet the following requirements:
 - Nationally recognized testing laboratory approval.
 - Insertion into a properly grounded outlet and not used in tandem or in conjunction with other adaptors.
 - Current breaker overload safety device and not exceed a maximum rating of 15 amps.
 - Protection from physical damage, not affixed to structures or extended through walls, ceilings, floors, under doors or floor coverings or be subject to any damage/impact.
 - No alterations in any manner.
9. De-energize electrical equipment before inspecting or making repairs. Prior to inspecting or repairing equipment, turn off the current at the switch box and lockout/tagout the system. Accidental or unexpected sudden starting of electrical equipment can cause severe injury or death.
10. Check the receptacle for missing or damaged parts. Do not plug equipment into defective receptacles.
11. When plugging in or unplugging power equipment, the power switch must always be in the OFF position.
12. Plugs must not be removed from outlets by yanking the cord.
13. Care must be taken when electrical equipment is used in areas where oxygen, flammable gases, or anesthetics are present. Sparks from electrical equipment can cause a fire or explosion.
14. Insulated tools are recommended when working near energized equipment.
15. When working with equipment that may pose an electrical hazard, wear the proper personal protective equipment, e.g., rubber, insulating gloves; hoods; sleeves; helmets; shoes; etc.
16. Prior to beginning a task that may involve an electrical hazard, be sure you are familiar with all safety procedures.

17. Supervisors are responsible for assuring that equipment such as radios, coffee pots, etc., meet the guidelines for proper grounding and other electrical safety standards.
18. In the event that a fellow employee receives an electric shock, turn off the current. Do not touch the victim until he or she can be separated from the current source. Use a nonconductive item such as a wooden broomstick

TRAINING:

Those employees facing a higher-than-normal risk of electric shock require training. That is, those employees working in areas not reduced to a safe level by the installation requirements of the National Electrical Code or OSHA General Requirements for Electrical System and Equipment Design.

Employees in the following occupations require training, as well as other employees, expected to encounter risk or injury due to electric shock or other electrical hazards.

Typical occupational categories of employees facing a higher than normal risk of electrical accident would be:

- Blue collar supervisors
- Electrical & electronic engineers
- Electrical & electronic equipment assemblers
- Electrical & electronic technicians
- Electricians
- Industrial machine operators
- Material handling equipment operators
- Mechanics and repairers (maintenance employees)
- Painters
- Riggers & roustabouts
- Stationary engineers
- Welders

Employees in these groups do not need training if their work, or the work of those they supervise, does not bring them close enough to exposed parts of electric circuits operating at 50 volts or more to ground for hazard to exist.

Content of Training

- All employees who face a risk of electrical shock, burns, or other related injuries not reduced to a safe level by the installation requirements of OSHA Sub-part W must have training. The training will cover the respective OSHA standards, all safety- related work practices, and equipment by OSHA Standard 1910.331 through 1910.335 that pertain to their job assignments.
- Additional requirements for unqualified persons - In addition to being trained in the safety practices related work, unqualified employees facing a risk of electric shock must have training in any electrically related safety practices not covered in these requirements or the OSHA Standards but which are necessary for employees' safety.