Electrical Safety Policy

Description

OBJECTIVE

This policy is intended to protect individuals working at the University of Florida from electrical hazards that may result in electric shock, burns, arc flash/blast or other injuries due to direct or indirect contact with electrical equipment, tools or appliances.

AUTHORITY

By authority delegated from the University President, the Vice-President for Business Affairs is responsible for the safety of all University facilities. Under this authority, policies are developed to provide a safe teaching, research, service, housing and recreational environment.
[su_spoiler style="fancy" icon="chevron" title=" Reference "] **Occupational Safety and Health Administration (OSHA) 29 CFR 1910.331 through 1910.335, "Electrical Safety Related Work Practices"**

National Fire Protection Association (NFPA) 70E, "Standard for Electrical Safety in the Workplace" 2009 edition
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POLICY

This policy applies to University employees working on or near premises wiring; installations of electric conductors and equipment and feeder circuit conductors in or on buildings, structures, and in other areas such as yards, parking and other lots, confined spaces and industrial substations. It also applies to the installation of optical fiber cable near or with electric wiring.

This policy does not apply to work performed by qualified personnel on or directly associated with the following installations: generation, transmission and distribution of electric energy located in buildings used for such purposes or located outdoors, communications installations and installations in vehicles.

For the purposes of this policy the following definitions apply:

Qualified person: One who has skills and knowledge related to the construction and operation of the electrical equipment and installations and has received safety training to recognize and avoid the hazards involved.

Unqualified person: A person who is not a qualified person.

RESPONSIBILITIES

[su_spoiler style="fancy" icon="chevron" title=" Environmental Health and Safety Division (EH&S) "] EH&S is responsible for the development and periodic review and updating of the Electrical Safety Policy. When requested, EH&S will provide assistance in identifying electrical safety issues.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" University Departments "] University Departments are responsible for the implementation of this policy through the development of the necessary specific written procedures, training of staff, purchase of equipment and modification to equipment and systems as necessary.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Supervisors "] Department supervisors are responsible for the enforcement of this policy and other specific written procedures and to assure that all necessary equipment is provided.

Supervisors are also responsible for identifying employees covered by this policy and ensuring that training is provided in the identification of potential electrical hazards and the means to protect themselves from those hazards.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Employees "] Employees are responsible for complying with the safe operating procedures in the Electrical Safety Policy as well as with any written safety procedures covering specific tasks. Employees must maintain an awareness of electrical safety issues and report safety concerns immediately. Employees are responsible for attending appropriate safety training and for wearing the appropriate personal protective equipment (PPE) when working with electrical equipment.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Contractors "] Contractors performing electrical work at University facilities or on University property are required to comply with all applicable OSHA standards including 29 CFR 1910 Subpart S and 29 CFR 1910.147 and NFPA Standard 70E.
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PROCEDURES

[su_spoiler style="fancy" icon="chevron" title=" Training"] Training shall be provided to any employee at risk of being exposed to an electrical hazard as part of their typical job duties. The level of training is dependent on the classification of the employee as either a "qualified person" or "unqualified person." A qualified person shall, at a minimum, receive training in the following topics:

- The safety related work practices that pertain to their job assignments as well as the ability to determine the PPE requirements necessary to perform their jobs safely.
- The skills and techniques necessary to distinguish exposed live parts from other parts of electric equipment.
- The skills and techniques necessary to determine the nominal voltage of exposed live parts.
- The allowable approach distances and corresponding voltages to which the qualified employee will be exposed.

An unqualified person shall, at a minimum, receive:

- An awareness level of electrical safety training and shall be familiar with the work practices

necessary to conduct their job safely.

Training must be performed before the employee is assigned tasks requiring work around or on electrical systems.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Selection and Use of Work Practices "]
Work practices must establish an electrically safe work condition prior to maintenance or other activities involving electrical installations or equipment. Live parts shall be de-energized using approved lockout/tagout procedures before work begins on or near the equipment.

The only exceptions to the de-energizing requirement are:

- The live parts operate at less the 50 volts to ground and there is no increased exposure to electrical burns or to explosion due to electric arcs.
- If de-energizing the equipment or installation will create an increased or additional hazard including interruption of life support equipment, deactivation of emergency alarms, shutdown of hazardous location ventilation systems or removal of illumination for an area.
- If turning power off is infeasible due to equipment design or operational limitations including testing of electrical circuits that can only be performed with the circuit energized and work on circuits that form an integral part of a continuous process that would otherwise need to be completely shutdown in order to permit work on one piece of equipment.

If live parts are not placed in an electrically safe work condition, the work performed is considered energized electrical work and shall be performed by written permit only. (See Appendix A). The completed permit must be posted in the area where the energized work is taking place for the duration of the task. The permit must be kept on file for at least 6 months following completion of the work.

A permit is not required for work performed by qualified persons related to testing, troubleshooting and voltage measuring provided the appropriate PPE is used.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Approach Boundaries to Live Parts "]
Observing a safe approach distance from exposed energized parts is an effective means of maintaining electrical safety. As the distance between an individual and live parts increases, the potential for an electrical injury decreases.

Safe approach distances to fixed live parts can be determined by referring to Appendix B which contains a table listing the Limited, Restricted and Prohibited approach distances to live parts.

Qualified persons shall not cross or take any conductive object closer to live parts operating at 50 volts or more than the Restricted Approach Boundary unless one of the following conditions applies:

- The qualified person is insulated or guarded from the live parts and no uninsulated part of the qualified person's body crosses the Prohibited Approach Boundary.
- The live parts are insulated from the qualified person and from any other conductive object at a different potential.

Crossing the Prohibited Approach Boundary is considered the same as making contact with energized parts. Qualified persons shall only cross this boundary when all of the following precautions have been taken:

- The qualified person has specific training to work on energized parts.
- The qualified person has obtained an approved Energized Electrical Work Permit The qualified person uses PPE appropriate for working on energized parts which are rated for the voltage and energy level involved.

Unqualified persons shall only cross the Limited Approach Boundary when they are under the direct supervision of a qualified person.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Other Precautions for Personnel Activities "] Employees shall not reach blindly into areas that might contain exposed live parts.

Employees shall not enter spaces containing live parts unless illumination is provided that allows the work to be performed safely.

Conductive articles of jewelry and clothing (such as watchbands, bracelets, rings, key chains, necklaces, metalized aprons, cloth with conductive thread, metal headgear or metal frame glasses) shall not be worn where they present an electrical contact hazard with exposed live parts.

Conductive materials, tools and equipment that are in contact with any part of an employee's body shall be handled in a manner that prevents accidental contact with live parts. Such materials and equipment include, but are not limited to, long conductive objects such as ducts, pipes, tubes, conductive hose and rope, metal lined rulers and scales, steel tapes, pulling lines, metal scaffold parts, structural members and chains.

When an employee works in a confined or enclosed space (such as a manhole or vault) that contains exposed live parts, the employee shall use protective shields, barriers or insulating materials as necessary to avoid contact with these parts. Doors, hinged panels and the like shall be secured to prevent them from swinging into employees.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Personal Protective Equipment "] Employees working in areas where electrical hazards are present shall be provided with and shall use protective equipment (Arc Flash Gear) that is designed and constructed for the specific body part to be protected and for the work performed.

Protective equipment shall be maintained in a safe, reliable condition and shall be visually inspected before use.

Employees shall wear nonconductive head protection wherever there is a danger of head injury from electric shock or burns due to contact with live parts or from flying objects resulting from electrical explosion.

Face, neck and chin protection shall be provided wherever there is a danger of injury from exposure to electric arcs or flashes or from flying objects resulting from electrical explosions.

Employees shall wear eye protection whenever there is a danger of injury from electric arcs, flashes or from flying objects resulting from electrical explosions. Face shields without an arc rating shall not be used for electrical work. Safety glasses or goggles must always be worn underneath face shields.

Employees shall wear rubber insulated gloves where there is a danger of hand and arm injury from

electric shock due to contact with live parts or where there is a possible exposure to arc flash burn. Leather or FR gloves shall be worn where required for arc flash protection. Where insulating rubber gloves are used for shock protection, leather protectors shall be worn over the rubber gloves.

Where insulated footwear is used as protection against step and touch potential, dielectric overshoes shall be required. Insulated soles shall not be used as primary electrical protection.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Selection of Personal Protective Equipment "] Personal protective equipment shall be provided to and uses by all employees working within the

Flash Protection Boundary. For systems that are 600 volts or less, the Flash Protection Boundary shall be a minimum of 4 feet. For systems above 600 volts, the Flash Protection Boundary shall be determined through engineering analysis.

The specific PPE to be worn within the Flash Protection Boundary can be determined by either of two methods:

1. Complete a detailed flash hazard analysis under engineering supervision that determines the incident exposure energy of each employee. Appropriate protective clothing can then be selected based on the calculated exposure level.
2. Determine the hazard level of the task by referring to NFPA 70E Table 130.7 (C) (9) (a), "Hazard/Risk Category Classifications" (Appendix C).This table also indicates whether voltage-rated gloves and/or voltage-rated tools need to be used. Once the hazard level of the task has been determined, the required PPE can be ascertained form the NFPA 70E Table 130.7 (C) (10), "Protective Clothing and PPE Matrix" (Appendix D).

[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Flame-Resistant Apparel and Underlayers "] Flame-resistant (FR) apparel shall be visually inspected before each use. FR apparel that is contaminated or damaged shall not be used. Protective items that become contaminated with grease, oil, flammable liquids or combustible liquids shall not be used.
The garment manufacturer's instructions for care and maintenance of FR apparel shall be followed.

FR clothing made from flammable synthetic materials that melt at temperatures below 315 degrees Celsius, such as acetate, nylon, polyester, polypropylene and spandex, either alone or in blends, shall not be used. Clothing made from non-melting flammable natural materials, such as cotton, wool, rayon or silk may be used as underlayers beneath FR apparel.

FR garments worn as outer layers over FR apparel (i.e. jackets or rainwear) must also be made from FR material.

Flash suits must permit easy and rapid removal by the user.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Insulated Tools and Equipment "] Only insulated tools and equipment shall be used within the Limited Approach Boundary of exposed energized parts.

Insulated tools shall be rated for the voltages on which they are used and shall be designed and constructed for the environment to which they are exposed and the manner in which they are used.

Fuse and fuse holder handling equipment, insulated for the circuit voltage, shall be used to remove or install a fuse if the fuse terminals are energized.

Ropes and hand lines used near exposed live parts operating at 50 volts or more or where an electrical hazard exists, shall be nonconductive.

Portable ladders shall have nonconductive side rails and shall meet the requirements of ANSI standards for ladders.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Rubber Insulating Equipment "] Rubber insulating equipment includes protective devices such as gloves, sleeves, blankets and matting.

All rubber insulating equipment shall comply with applicable American Society for Testing and Materials (ASTM) standards.

Insulating equipment must be inspected for damage before each day's use and immediately following any incident that could have caused damaged.

Rubber insulating equipment must be stored in an area protected from light, temperature extremes, excessive humidity, ozone and other substances and conditions that may cause damage.
[/su_spoiler] [su_spoiler style="fancy" icon="chevron" title=" Alerting Technique "] Barricades shall be used in conjunction with safety signs to prevent or limit access to work areas containing live parts. Conductive barricades shall not be used where they might cause an electrical hazard. Barricades shall be placed no closer that the Limited Approach Boundary.

If barricades and signs do not provide sufficient warning and protection from electrical hazards, an attendant shall be stationed to warn and protect employees. The primary duty of the attendant shall be to keep unqualified persons out of the work area where an electrical hazard exists. The attendant shall remain in the area for as long as there is a potential exposure to electrical hazards.

Appendices A through D
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