



Policy Title:	Electrical Safety Work Practice Program
Policy Number:	UNIV-430
Revision Date:	October 2021
Policies Superseded:	FINA-730
Policy Management Area(s):	Environmental Health and Safety

SUMMARY:

The Electrical Safety Policy establishes and prescribes procedures that will assure compliance with all federal, state and local regulations applicable to electrical work, and reduce the number of incidents and losses associated with the operation, maintenance and repair of electrical equipment and devices

I. DEFINITIONS

- A. Qualified employees - individuals who, through training and/or experience, are permitted to work on or near exposed energized electrical equipment or parts. The work conducted by a qualified employee will involve either direct contact or contact by means of tools and materials. A qualified individual must possess at minimum an Electrical Journeyman's license from a governmental agency.
- B. Unqualified employees - individuals who are not permitted to physically work on exposed energized electrical equipment, parts, or repairs electrical devices; but who will have this type of equipment in their work area. An unqualified employee will not get closer than 3.5 feet or posted Arc Flash Boundary away from an open energized circuit or panel.

II. POLICY

- A. Coastal Carolina University's (CCU's) primary goal is to operate, maintain and repair all electrical equipment and devices in a safe and proper manner to protect students and employees from potentially hazardous or unsafe conditions. Guidelines and procedures outlined in this policy have been developed to help ensure safe work procedures and comply with Occupational Safety and Health Administration (OSHA) General Industry Standard 29 CFR 1910.301 through 1910.399 (Subpart S) and OSHA Construction Industry Standard 29 CFR 1926.400 through 1926.449 (Subpart J), National Fire Protection Association (NFPA) 70 E, National Electric Codes (NEC), state, and local building codes. The following

objectives will be met in order to accomplish this goal:

1. All electrical equipment and devices will be free from recognized hazards that are likely to cause injury or death.
2. Electrical safety procedures will be followed and proper protective equipment is provided to protect employees from electrical hazards and risk N Table 130.7(C)(14).
3. Electrical circuit equipment will be properly labeled to meet NFPA 70 E (2015 edition) Hazard/Risk Category Classification (Arc Flash Boundary) requirements by individual circuit calculations outlined in NFPA 70 E (2015 edition), Informational Annex D, or use NFPA 70 E (2015 edition) Table 130.7 (C)(15)(a).
4. Electric circuits will be marked in such a way to indicate their purpose and the location of the disconnect panel or energy source.
5. Arc flash and shock boundaries will be maintained around electrical equipment, and proper personal protective equipment outlined in NFPA 70 E (2015 edition), Table 130.7(C)(16) will be utilized by the qualified employee.
6. Each employee's specific job classification will be designated as qualified or unqualified with respect to potential electrical exposures.
7. Each employee's specific job classification will be designated as qualified or unqualified with respect to potential electrical exposures.
8. Qualified employees will de-energize electrical equipment according to NFPA 70 E and CCU Lockout/Tagout Policy (see policy UNIV-EHS 425).
9. Employees will utilize safe work practices that prevent contact with energized circuits and live electrical parts.
10. An Energized Electrical Work Permit (Appendix A) must be completed and approved prior to any work being performed on live circuits.
11. All electrical panels and associated equipment must have at least a 3.5 foot clearance or Arc Flash Boundary whichever is greater to provide an unobstructed boundary.
12. Electrical panel rooms must be kept clean of clutter and will not be used as general storage rooms.

III. RESPONSIBILITIES

- A. Department Director - The Department Directors for both qualified and unqualified employees are responsible for the Electrical safety work Practices of their staffs. Every department must keep a current list of qualified employees and the name of at least one "electrically knowledgeable person." The Safety Coordinator must receive a copy of each current list. Department Directors will ensure that proper protective equipment is available and used when necessary by their employees.
- B. Safety Coordinator – The EHS Director is responsible for developing the written Electrical safety work Practice Program, with assistance from maintenance, and

EHS personnel. The Safety Coordinator will audit the entire program annually, and will ensure that required training is conducted for all affected employees.

- C. Supervisors - Each departmental supervisor is responsible for the day to day implementation and enforcement of the Electrical Safety Work Practice Program in their area of jurisdiction. Each department supervisor is responsible for notifying the safety coordinator when new installations and/or equipment need to have revision/additions made to the documented and implemented procedures. All procedures must be approved by the departmental supervisor before being implemented. Supervisors are responsible for the annual review of their employee's proficiency in following established work practices and procedures, and notifying the safety coordinator when employees need initial and refresher safety training. Documentation of annual reviews should be forwarded to the safety coordinator. Supervisors must ensure that required safety equipment is made available to employees required to perform electrical related duties.
- D. Qualified Employees - Qualified Employees are responsible for following procedures established in the Electrical safety work Practice Program.
- E. Unqualified Employees - Unqualified Employees are responsible for doing their best to avoid electrical shock and for notifying their supervisors if conditions exist which could lead to electrical shock.

IV. TRAINING

- A. Qualified Employees - Training will be in the classroom and/or on-the-job and will introduce and establish proficiency in electrical safety work practices. All qualified employees will be trained in and become familiar with the following information:
 - 1. The skills and techniques necessary to distinguish exposed live parts from other parts of electrical equipment.
 - 2. The skills and techniques necessary to determine the nominal voltage of exposed live parts.
 - 3. The clearance distances specified for various voltages to which the qualified person will be exposed.
 - 4. Proper Lockout/Tagout procedures as outlined in Policy UNIV-EHS 425 used to de-energize electrical equipment before work is conducted.
 - 5. The proper use of personal protective equipment, insulating and shielding materials, and insulated tools.
 - 6. The safe and proper use of portable electrical equipment, including handling, visual inspection, grounding, conductive work locations and extension cords.
 - 7. First aid, cardiopulmonary resuscitation (CPR), automatic external defibrillator (AED) and emergency procedures
- B. Unqualified Employees - All unqualified employees will be trained in and become

familiar with the following information:

1. The risks associated with energized equipment.
 2. The tasks that can be done only by qualified employees.
 3. The techniques to protect themselves when working around electricity.
 4. The importance of obeying electrical hazard signs and tags.
- C. Training Frequency - Designated qualified and unqualified employees will receive initial training at the time of their employment and refresher training every three years. Additional training will be provided whenever there is a change in equipment or processes that will present a new hazard or when there is a change in electrical energy control procedures. Whenever a periodic inspection reveals that an employee has deviated from or has been inadequately trained regarding electrical safety work practices, said employee(s) will require repeat or additional training to re-establish employee proficiency and/or to introduce new or revised control methods and procedures as necessary.
- D. Random/Periodic Evaluations - The electrical safety program will be periodically evaluated by the EHS Department. Periodic evaluations will be performed to ensure that the electrical safety work practices are being properly implemented. Qualified and unqualified employees will be randomly evaluated during health and safety audits. Infractions will be reported immediately to the involved employee and his/her supervisor and will be documented in the inspection report.

V. PROTECTIVE MEASURES and EQUIPMENT

- A. Test Instruments and Equipment
1. Only qualified employees will perform test work on electrical circuits or equipment.
 2. All test instruments, equipment and associated leads, cables, power cords, probes, and connectors will be visually inspected for external defects and damage before the equipment is used. If any defect or damage is noted that will expose the employee to injury, the item will be removed from service and will not be used until repairs and tests have been made.
 3. Test instruments, equipment and their accessories will only be connected to the circuits and equipment for which they were designed and will only be used in the environment for which they are approved. They must be rated above the anticipated voltage of the circuit to be tested.
- B. Personal Protective Equipment (PPE) - Employees working in areas where there are potential electrical hazards will use electrically rated PPE that is appropriate for the specific parts of the body and that has the proper arc flash protection rating for the work being performed.
1. All qualified employees working on live electrical parts must utilize NFPA 70 E Table 130.7(C)(16) arc flash-rated PPE including approved insulating

- gloves, electrically rated steel-toed boots, safety glasses and face shield.
2. All qualified employees will be furnished fire and arc-rated (FR/AR) clothing.
 3. Electrically rated insulated tools or handling equipment will be utilized if there is a potential risk that the items might make contact with conductors or live electrical parts.
 4. Approved fuse handling equipment that is insulated for the circuit voltage must be used to remove or install fuses when the fuse terminals are energized.
 5. Insulating materials, such as switchboard matting and insulated blankets, will be used when deemed necessary in work procedures.

C. Protective Practices - The following is a list of electrical safety work practices that will be followed at Coastal Carolina University:

1. Lockout/Tagout procedures will be used to deenergize electrical equipment before work is conducted. Verification of complete deenergization of the circuit is required prior to work startup.
2. When normally enclosed live parts are exposed for maintenance or repair, they will be guarded to protect unqualified persons from contact with live energized parts. Barricades will be used if necessary. If barricades are not sufficient, then attendants will be used.
3. All electrical switches, fuses and circuit breaker panels must be evaluated, rated and labeled as to the NFPA arc flash potential for the device. Any work done on these devices while energized must be performed by a qualified employee using the properly rated PPE.
4. Qualified employees will not approach or take any conductive object without an approved insulating handle closer than 4 feet to any exposed energized parts. Approved electrical gloves and sleeves must be utilized if approaching closer than 4 feet.
5. Employees and/or conductive tools will not come within 10 feet of any unguarded, energized overhead power line.
6. Conductive items, such as jewelry, watch bands, bracelets, rings, key chains, necklaces, etc., will not be worn if they could contact exposed energized parts.
7. Electrical extension cords will not be a substitute for permanent wiring. The minimum size of an extension cord will be 16 gauge copper wire, three-wire type, with one wire being a permanent ground. The extension cords must be in good condition with no damage to the outer protective insulation or the plug and receptacle ends. Damaged cords must be taken out of service immediately and repaired or destroyed. Sixteen-gauge extension cord repairs are prohibited and damaged ones must be destroyed. Larger gauge wire can be repaired by a qualified employee by installing new Nepco type ends and heat shrink insulation patches. Electrical tape repairs are not allowed on any extension cord. Extension cords must not be used in or routed through wet areas.

8. A Ground Fault Interrupt Circuit (GFIC) is required for all electrical outlets located in potentially wet locations (e.g., bathroom, laboratory, kitchen), for outdoor extension cords, and for any construction site or building activity, including remodeling. Vending machine must be connected to a GFIC circuit regardless of location.
9. Flammable storage cabinets must be properly grounded per manufacturer's instruction. Bonding cables must be available in the interior of the cabinet to bond containers to the cabinet as well as to bond containers together when transferring contents between them.
10. Machines, branch circuits, and electrical equipment must have a separate switch in addition to the fuse or circuit breaker in the panel box to energize the device or circuit, i.e., light switches are available to energize lighting, and motor switches are available to start-up electric motors.
11. All electrical circuits must be properly phased as to current polarity.
12. Metal ladders are strictly prohibited for use on any electrical work.
13. Circuit breakers are not to be used as light switches or motor starters.

APPENDIX A

CCU ENERGIZED ELECTRICAL WORK PERMIT

WORK ORDER# _____

PART I

- 1 Circuit/Equipment/Location Description: _____
- 2 Work Description: _____
- 3 Energized Work Justification: _____

PART II

- | | Check when complete |
|--------------------------------------|--------------------------|
| 1 Work Procedures to be Used: _____ | <input type="checkbox"/> |
| 2 Safe Work Practices Details: _____ | <input type="checkbox"/> |

SHOCK HAZARD ANALYSIS:

- | | | |
|--------------------------------|------------|--------------------------|
| 3 Limited Approach Boundary | _____ Feet | <input type="checkbox"/> |
| 4 Restricted Approach Boundary | _____ Feet | <input type="checkbox"/> |
| 5 Prohibited Approach Boundary | _____ Feet | <input type="checkbox"/> |

ARC FLASH HAZARD ANALYSIS

- | | | |
|---|----------------|--------------------------|
| 6 Available Incident Energy or Hazard/Risk Category | _____ Rate/Cat | <input type="checkbox"/> |
| 7 Arc Flash Boundary | _____ Feet | <input type="checkbox"/> |
| 8 Required and Necessary PPE and Tools Available | YES NO | <input type="checkbox"/> |
| 9 Detail How Unqualified Persons Are Restrict From Work Site: _____ | | <input type="checkbox"/> |
| 10 Will/Was a Job Briefing Conducted for This Work? | YES NO | <input type="checkbox"/> |
| 11 Do You Agree This Energized Work Can be Performed Safely ? | YES NO | <input type="checkbox"/> |

If no, send copy to Safety Coordinator

Electrically Qualified Person In Charge of This Work Order

Date

PART III APPROVAL TO PERFORM WORK ON ELECTRICALLY ENERGIZED CIRCUITS:

Supervisor

Date

Director

Date

Safety Coordinator

Date

Must have two or more signatures to perform work

Send completed form to Safety Coordinator