



## **Electrical Safety Program Procedures**

### **I. SUPERVISORS**

1. Ensure that all of your technicians have received the proper electrical safety training as described in this program before you allow them to begin work. Ensure that they receive a copy of this program and understand the program's principles, controls and specific electrical safety training requirements. Assess their abilities by testing them on the knowledge they need to protect themselves from electrical hazards.
2. Conduct occasional audits to ensure that all of the electrical safety program principles established are appropriate, and are being followed by the affected technicians.

### **II. MECHANICAL SERVICE TECHNICIANS**

1. Carefully plan each job well before you have to start the work. Make sure that you have all of the proper tools, equipment and permits (if required). Think through the electrical safety program procedures so that you can easily incorporate them into the troubleshooting, maintenance and/or repair processes.
2. Anticipate unexpected events by thinking through all conceivable possibilities. Remain cognizant of possible unexpected events by giving your undivided attention/concentration to the task.
3. Never approach a unit with exposed, energized electrical conductors and/or circuit parts closer than 4 feet without following the safe work practices and personal protective equipment requirements described in this section. The 4 foot approach and protection boundary is the greater of the two boundaries established for **Qualified Persons** for shock and arc flash protection. The 4 foot boundary applies to any conductive objects that you might be carrying as well.
4. Before opening the access door or removing the panel to any energized unit/equipment, inspect/evaluate it to ensure that you know its voltage capacity. All HVAC units/equipment are required to be labeled. Labels applied before September 30, 2011 must show the available incident energy or the required level of personal protective equipment. Labels applied on or after September 30, 2011 must show available incident energy and the corresponding work distance, **or** the minimum arc rating of the clothing, **or** the required level of PPE, **or** the highest Hazard/Risk Category (HRC) for the equipment. The labels must also show the nominal system voltage **and** the arc flash boundary. If there is no label on the equipment/unit, report it in writing to the owner representative and to your supervisor. Also, ensure that all visible parts appear to be in

good condition. **(If the unit is pushing more than 480 volts, this program does not apply. Before you proceed, obtain and follow an electrical safety program established for units/equipment pushing the higher voltage of the unit you will be servicing.)**

5. Before opening the access door or removing the panel to any energized unit, put on the following personal protective equipment:
  - a. 8 calorie Arc-rated (AR) long sleeve shirt, pants, and balaclava;
  - b. Ear plugs;
  - c. Safety glasses;
  - d. Class E hardhat with attached 8 calorie arc-rated face shield;
  - e. Class 00 rubber gloves; and
  - f. Leather protective gloves over the rubber gloves (leather protector gloves must be made entirely of leather and have a minimum thickness of 0.03 inches. If the gloves are lined, they must be lined with non-flammable and non-melting fabrics).
6. Be sure to use only properly selected/rated voltage testers (multimeters) and ammeters to test electrical circuits. Visually inspect all testing equipment including the leads, cables, power cords, probes and connectors before each use.
7. If you see any signs of damage do not use the equipment. Attach a “Danger – Do Not Use” sign to the equipment and take it out of service immediately. Give it to **(key in the name of the designated individual who will repair or replace the equipment)** as soon as possible.
8. Use all testing equipment in conformance with the manufacturers’ recommendations.
9. Only use the testing equipment that is provided by the company. Never use light-up-type testing equipment.
10. Before testing voltage on electrical conductors and/or circuit parts test the meter on a known, live source. Then test the electrical conductors and/or circuit parts. Finish by testing the meter again on a known live source. If you detect any inconsistencies or discrepancies with the meter, take it out of service immediately as described above and repeat this process with a properly selected/rated replacement meter.
11. Use only properly rated insulated tools to conduct troubleshooting as necessary to determine what’s wrong with the unit.
12. As soon as you have identified the problem, stand to one side of the external service disconnect. Shut off the power. Lockout the disconnect supplying the unit when lockout procedures are required (see Simple Lockout Procedures on page 13). If lockout is necessary, follow the company’s lockout procedures as described in this program. **(This step does not apply to units/equipment with built-in interlocking disconnects.)**
13. Test the unit to ensure that the power has been shut off.

14. Discharge any stored energy such as the current in the capacitors.
15. Once the unit is “tested dead” and any stored electrical current has been discharged, you may remove your gloves, hardhat, arc-rated face shield, balaclava, and ear plugs. Also, if necessary due to extreme heat or other conditions, you may remove the arc-rated (AR) clothing. **(Step 15 does not apply to units/equipment with built-in interlocking disconnects. If you’re working on a unit with a built-in interlocking disconnect, keep all of your personal protective equipment on at all times throughout the troubleshooting and repair/maintenance process.)**
16. Complete repairs/maintenance on the unit.
17. Remove all of your tools and materials from inside the unit.
18. Close the access door or replace the panel.
19. Put on all personal protective equipment described in Step 5.
20. Remove the lockout device if applicable.
21. Stand to one side of the external service disconnect and start the power. **(This step does not apply to units/equipment with built-in interlocking disconnects.)**
22. Ensure that the structural integrity of the unit (enclosure) is in good condition.
23. If you encounter any unusual first time procedures, write them down and report them to your supervisor. Give the supervisor a copy of your written procedures.
24. Do not allow **“Unqualified Persons”** to come within 10 feet of any unit that is not in an electrically safe work condition. The unit’s door or panel must be closed and there must be no exposed energized electrical conductors and/or circuit parts for an unqualified person to approach safely.