

1.8 Requirement for Safety in the Work Place

This section is critical to the AAAE ACE certification training due to the introduction by FAA in AC 150/5340-26C the recommendations to improve safety in the workplace. This is part of an effort by numerous standards organizations to put increased emphasis on improving worker safety. There are provided in the above AC reference specific training requirements for workers that service the airport series circuit and associated electrical equipment. Workers are required to successfully complete specific training in the areas of their involvement which has been documented by the airport or other recognized training organization. This course is intended to be an integral part in the worker training process. As an airport maintenance worker you should request certifiable training that will through the knowledge imparted help keep you safe and satisfy the training requirement. The airport should make sure appropriate training has been given to help insure worker safety and reduce their liability that results from any worker injury or air carrier incident that may have been prevented by appropriate airfield maintenance worker training.

Paragraph 2 introduces the emphasis on safety and paragraph 2.2 of 150/5340-26C is a new section added to be in better alignment with the personnel safety requirements in National Fire Protection Association (NFPA) 70E, Standard for Electrical Safety in the Workplace.

This section provides information that will aid airport owners/operators in establishing an effective safety program. Safety is the responsibility of everyone and must be practiced in every maintenance activity that is performed. Any additional local operational procedures and OSHA requirements should also be followed. The safety program established at each airport should include preventive safety precautions used when servicing the equipment and first-aid procedures for use in the event of an injury.

We are all surrounded by various hazards every day such as the careless driver using a cell phone that we see on our way to work. Safety is everyone's responsibility and our own responsibility. We cannot delegate our safety responsibilities to others. It is our responsibility to set the safety example for others. Safe work practices is a learned attitude and skill we should be passing on to our fellow workers and our family.

Safety is no accident. Know and comply with your company's safety program and lockout/tagout procedure. Use and store personal protective equipment (PPE) properly. Verify that your test equipment functions properly. Become familiar and knowledgeable with National Fire Protection Association (NFPA) 70E, Standard for Electrical Safety in the Workplace. Should a conflict between your local safety plan and this document occur, we recommend adherence to the stricter (safer) requirement.

1.8.1 Safety Requirements.

Only a qualified person, per the definition in NFPA 70E, performs maintenance work. The qualified person must possess the requisite technical skills and be trained to recognize and avoid electrical hazards. The qualified person must also be trained in the proper procedures for operations in an aircraft operation area (AOA). A person may be considered qualified for certain tasks and not qualified for others.

A Qualified Person as defined in **NFPA 70E-2012** is: *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.*

A person may be considered qualified for certain tasks and not qualified for others.

A qualified person must, at a minimum, be additionally trained to:

- Distinguish exposed live parts from other parts.
- Determine nominal voltage of exposed parts.
- Determine the approach distances in NFPA 70E; Table 130.2(C).
- Possess the decision-making skills necessary to determine the degree and extent of hazard, Personal Protection Equipment (PPE) required and planning to safely perform the job.
- Perform a Hazard/Risk evaluation of the task to be accomplished. For an example of a Hazard/Risk procedure, refer to NFPA 70E, Annex F.

When performing repetitive tasks we tend to take safety for granted. Do not let familiarity with the task provide a false sense of security. A task performed 100 times unsafely without an injury is still unsafe.

A qualified person before starting each task, should review the following basic items:

- Hazards associated with the work.
- Safe work procedures and any special precautions.
- Energy source controls.
- PPE requirements.

1.8.2 Creating an Electrically Safe Work Condition

Energized parts or components that an employee may be exposed to must be put into an electrically safe work condition before an employee works on or near them. Electrical components must be considered to be energized until the source(s) of energy is (are) removed, at which time they must be de-energized. In addition, remove all other sources of energy or stored energy – capacitors, pneumatic, steam, chemical, springs, gravity, jet blast, etc.

- a. Determine all sources of energy to the equipment.
- b. Turn off the equipment using proper controls; open the disconnecting means for each electrical source.

- c. When possible, visually verify all blades of the disconnecting device are fully open and/or draw-out type circuit breakers are withdrawn to the fully open position.
- d. Verify all other energy sources have been identified and turned off, removed, blocked or secured as required to safely and properly control the specific energy source.
- e. Apply lockout/tagout devices per documented and established policy.
- f. Use an adequately rated volt meter to test phase-to-phase and phase-to-ground for voltage. Before and after the test, verify proper operation of the test equipment.
- g. Where the possibility of induced voltages or stored electrical energy exists, ground the phase conductors or circuit parts. If components could become reenergized use grounds that can withstand fault currents.
- h. Only when the previous seven steps (2.2.4a through 2.2.4g) are successfully completed, is it possible to create an Electrically Safe Work Condition.

1.8.3 Defining an Electrically Unsafe Work Condition

An electrically unsafe work condition is defined as “working on or near live parts of 50 volts or more.” The word, “near” is defined as “within the limited approach boundary provided by NFPA 70E, Table 130.4(C) and Table 130.4(C)(b).” To perform work on or near live parts of 50 volts or more, the following steps must be accomplished:

- a. Justification – Demonstrate that de-energizing introduces additional or increased hazards or is not feasible due to equipment design or operational limitations. (see NFPA 70E, Section 130.2)
- b. Complete an energized work permit that authorizes work on energized equipment.
- c. Perform an electrical hazard analysis consisting of:
 - 1. A **shock hazard analysis** to determine the voltage(s) to which personnel will be exposed, boundary requirements and the personal protective equipment (PPE) necessary to minimize the possibility of electric shock to personnel.
 - 2. A **flash hazard analysis** must be completed to protect personnel from the possibility of being injured by an arc flash. The analysis determines the flash protection boundary and the PPE that personnel within the flash protection boundary must use.
- d. Implement the requirements of the shock and flash hazard analysis prior to starting any work.
- e. Complete the work safely and return the system to safe operating status.
- f. Close out the energized equipment work permit.