

# Significant Revisions for the 2018 NFPA 70E



*Keeping People Safe from Electrical Hazards for over 50 Years*



# **Today's Presenter**

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**Dennis K. Neitzel, CPE, CESC**

**Director Emeritus, AVO Training Institute**

**NFPA 70E Principal Technical Committee Member**



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# Article 100 Definitions

# Electrical Safety

- ▶ **Identifying** hazards associated with the use of electrical energy and taking precautions **to reduce the risk associated with those hazards.**

# Maintenance, Condition of

- ▶ The state of the electrical equipment considering the manufacturers' instructions, manufacturers' recommendations, applicable industry codes, standards and recommended practices.

# Risk Assessment

- ▶ An overall process that identifies hazards, estimates the likelihood of occurrence of injury or damage to health, estimates the potential severity of injury or damage to health, and determines if protective measures are required.

# Working Distance

- ▶ The distance between a person's face and chest area and a prospective arc source.



# **Article 105**

## **Application of Safety- Related Work Practices**

# 105.3 Responsibility

## ▶ 105.3(A) Employer Responsibility.

- The employer shall have the following responsibilities:
  - 1) Establish, document, and implement the safety-related work practices and procedures required by this standard.
  - 2) Provide employees with training in the employer's safety-related work practices and procedures.

# 105.3 Responsibility

## ▶ 105.3(B) Employee Responsibility.

- The employee shall comply with the safety-related work practices and procedures provided by the employer.

# 105.4 Priority

## ▶ Priority.

- Hazard elimination shall be the first priority in implementation of safety-related work practices.
- **Informational Note:** Elimination is the first risk control method listed in the hierarchy of risk control identified in 110.1(H).

# **Article 110**

## **General Requirements for Electrical Safety-Related Work Practices**

# 110.1 Electrical Safety Program

## (H) Risk Assessment Procedure.

- The electrical safety program shall include a risk assessment procedure and shall comply with 110.1(H)(1) through 110.1(H)(3).

# 110.1 Electrical Safety Program

## (H) Risk Assessment Procedure

### 1) Elements of a Risk Assessment Procedure.

The risk assessment procedure shall address employee exposure to electrical hazards and shall identify the process to be used by the employee before work is started to carry out the following:

- 1) Identify hazards
- 2) Assess risks
- 3) Implement risk control according to the hierarchy of risk control methods

# 110.1 Electrical Safety Program

## (H) Risk Assessment Procedure

### 2) Human Error.

The risk assessment procedure shall address the potential for human error and its negative consequences on people, processes, the work environment, and equipment.

**Informational Note:** The potential for human error varies with factors such as tasks and the work environment. See Informative Annex Q.



# 110.1 Electrical Safety Program

## (H) Risk Assessment Procedure

### 3) Hierarchy of Risk Control Methods.

The risk assessment procedure shall require that preventive and protective risk control methods be implemented in accordance with the following hierarchy:

- 1) Elimination
- 2) Substitution
- 3) Engineering controls
- 4) Awareness
- 5) Administrative controls
- 6) PPE

# 110.1 Electrical Safety Program

## (H) Risk Assessment Procedure

- **Informational Note No. 1:** Elimination, substitution, and engineering controls are the **most effective** methods to reduce risk as they are usually applied at the source of possible injury or damage to health and they are less likely to be affected by human error. Awareness, administrative controls, and PPE are the **least effective** methods to reduce risk as they are not applied at the source and they are more likely to be affected by human error.

# 110.1 Electrical Safety Program

## (I) Job Safety Planning and Job Briefing

- Before starting each job that involves exposure to electrical hazards, the employee in charge shall complete a job safety plan and conduct a job briefing with the employees involved.

# 110.1 Electrical Safety Program

## 1) Job Safety Planning.

- The job safety plan shall be in accordance with the following:
  - 1) ...by a qualified person
  - 2) ... documented
  - 3) ... Include ...:
    - (a) through (e)
    - [Job and task description, identify electrical hazards, shock and arc flash risk assessments, and procedures, precautions, and controls]

# 110.1 Electrical Safety Program

## (J) Incident Investigations.

The electrical safety program shall include a requirement to investigate electrical incidents.

**Informational Note:** Electrical incidents include events or occurrences that result in, or could have resulted in, a fatality, an injury or damage to health. Incidents that do not result in fatality, injury or damage to health are commonly referred to as a “close call” or “near miss.”

# **Article 120**

## **Establishing an Electrically Safe Work Condition**

# Article 120

- ▶ **Lockout/Tagout Auditing** moved to 110.1(K)(3)
- ▶ **Lockout/Tagout Training** moved to 110.2(B)

# Article 120

- ▶ **120.1 Lockout/Tagout Program**
- ▶ **120.2 Lockout/Tagout Principles**
- ▶ **120.3 Lockout/Tagout Equipment**
- ▶ **120.4 Lockout/Tagout Procedures**
- ▶ **120.5 Process for Establishing & Verifying an Electrically Safe Work Condition**



# Article 120

## 120.4 Lockout/Tagout Procedures

### (4) Simple Lockout/Tagout Procedure.

**Exception:** Lockout/tagout is not required for work on cord- and plug-connected equipment for which exposure to the hazards of unexpected energization of the equipment is controlled by the unplugging of the equipment from the energy source, provided that the plug is under the exclusive control of the employee performing the servicing and maintenance for the duration of the work.

(OSHA states: “The plug is under the exclusive control of the employee if it is physically in the possession of the employee, or in arm's reach and in line-of-sight of the employee, or if the employee has affixed a lockout/tagout device on the plug.”)

# Article 120

## 120.5 Process for Establishing and Verifying an Electrically Safe Work Condition

Establishing and verifying an electrically safe work condition shall include all of the following steps, which shall be performed in the order presented, if feasible:

- 4) Release **stored electrical energy**
- 5) Release or block **stored mechanical energy**

# **Article 130**

## **Work Involving Electrical Hazards**

# 130.2 Electrically Safe **Work** Conditions

## (A) Energized Work

- **(4) Normal Operating Condition.** Normal operation of electric equipment shall be permitted where **a normal operating condition exists. A normal operating condition exists when** all of the following conditions are satisfied:
  - 1) ...properly installed.
  - 2) ...properly maintained.
  - 3) The equipment is used in accordance with instructions included in the listing and labeling and in accordance with manufacturer's instructions.
  - 4) ...doors are closed and secured.
  - 5) ...covers are in place and secured.
  - 6) ...no evidence of impending failure.

# 130.5 Arc Flash Risk Assessment

## (A) General.

An arc flash risk assessment shall be performed:

- 1) To identify arc flash hazards
- 2) To estimate the likelihood of occurrence of injury or damage to health and the potential severity of injury or damage to health
- 3) To determine if additional protective measures are required, including the use of PPE

# 130.5 Arc Flash Risk Assessment

## (B) Estimate of Likelihood and Severity.

The estimate of the likelihood of occurrence of injury or damage to health and the potential severity of injury or damage to health shall take into consideration the following:

- 1) The design of the electrical equipment, including its overcurrent protective device and its operating time
- 2) The electrical equipment operating condition and **condition of maintenance**

# 130.5 Arc Flash Risk Assessment

## **(C) Additional Protective Measures.**

If additional protective measures are required they shall be selected and implemented according to the hierarchy of risk control identified in 110.1(H). When the additional protective measures include the use of PPE, the following shall be determined:

- 1) Appropriate safety-related work practices
- 2) The arc flash boundary
- 3) The PPE to be used within the arc flash boundary

# 130.5 Arc Flash Risk Assessment

## (G) Incident Energy Analysis Method.

- The incident energy analysis shall take into consideration the characteristics of the overcurrent protective device and its fault clearing time, including its condition of maintenance.
- The incident energy analysis shall be updated when changes occur in the electrical distribution system that could affect the results of the analysis. The incident energy analysis shall also be reviewed for accuracy at intervals not to exceed 5 years.



# 130.7 Personal and Other Protective Equipment

## (A) General.

Employees exposed to electrical hazards when the risk associated with that hazard is not adequately reduced by the applicable electrical installation requirements shall be provided with, and shall use, protective equipment that is designed and constructed for the specific part of the body to be protected and for the work to be performed.

# Questions?



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