



# CERTIFICATION PROGRAM

## Certified Electrical Safety Worker (CESW)

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### Candidate Handbook

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Version 7/21/22



This Certified Electrical Safety Worker (CESW) Candidate Handbook contains important program information. Please carefully review this handbook and retain it for future reference.



## Certified Electrical Safety Worker (CESW) Program Summary

**Program Overview** – The NFPA Certified Electrical Safety Worker (CESW) program is designed to meet the needs of Electricians, Electrical Testing Technicians and other electrical professionals who perform hands-on electrical work and are therefore exposed to significant electrical hazards. It consists of a set of eligibility requirements (completed prior to program application), a 110 question computer-based exam, and a set of recertification requirements (based on a points system) that must be completed within a three (3) year time period following initial certification.

**Program Application & Duration** – The CESW program application form is found online at [www.nfpa.org/CESW](http://www.nfpa.org/CESW). Please ensure that you are logged in to your NFPA.org profile. You have twelve (12) months after you are accepted as a CESW applicant to take and pass the exam. The twelve (12) month timer starts on the day your CESW program application is accepted by the NFPA Admin & Support Services.

**Program Fees** – The initial application and exam is \$350 USD, and \$150 USD to recertify at the end of your three (3) year certification period. If you do not pass the exam and need to retest, the fee is \$175.

**Payment** – Payment must be received before any exam is taken. NFPA accepts credit cards and checks. Please ensure all checks are made payable to “NFPA” and are sent to the mailing address listed below.

**Exam** – The exam is a three (3) hour maximum, open-book, 110 multiple choice question, computer-based, proctored exam taken at an approved testing center. You may only bring an NFPA printed **2021 NFPA 70E Standard for Electrical Safety in the Workplace** book and an approved calculator into the testing area during the exam. No photocopied or other duplicated or electronic versions of the NFPA 70E Standard are permitted in the testing area during your exam.

**Exam Results** – You will receive your exam results at the completion of your examination.

**Retesting** – If you fail your exam, you are permitted to retest two (2) additional times (**completing a retest application and paying a retest fee each time**) within twelve (12) months from the day your original CESW application was accepted. If you fail the examination three (3) times within this period, you must wait until the twelve (12) month testing period expires before you will be allowed to restart the registration process. For candidates who entered the program after 5/18/22, the retest application form is found on the CMS at <http://onlinecertification.nfpa.org/nfpassa>. For candidates who entered the program prior to 5/18/22, a downloadable PDF is available at [www.nfpa.org/cfi](http://www.nfpa.org/cfi). The cost to retest is \$175 USD.

**Recertification** – Once you become CESW certified, you must recertify every three (3) years. The recertification form is available online at [www.nfpa.org/CESW](http://www.nfpa.org/CESW). You must earn a specific number of recertification points within the three (3) year recertification period. The fee for recertification is \$150 USD.

NFPA Admin & Support Services  
11 Tracy Drive  
Avon, MA. 02322  
(Email) [adminsvcs@nfpa.org](mailto:adminsvcs@nfpa.org)  
(Web) [www.nfpa.org/CESW](http://www.nfpa.org/CESW)

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# About NFPA

## Overview

The National Fire Protection Association (NFPA) is a nonprofit membership organization founded in 1896 and having today more than 75,000 members. The mission of NFPA is to reduce the worldwide burden of fire and other hazards on the quality of life.

NFPA's technical activity involves development, publication, and dissemination of more than 350 timely consensus codes and standards intended to minimize the possibility and effects of fire and electrical and other hazards. NFPA codes and standards are developed by nearly 250 technical committees, each of which represents a balance of affected interests. More than 7,000 representatives serve voluntarily on NFPA committees. NFPA codes and standards, which are developed under the approved process of the American National Standards Institute (ANSI), are widely used as a basis of legislation and regulation at all levels of government. In some way, virtually every building, process, service, design, and installation in society today is affected by codes and standards developed through NFPA's system.

# NFPA Certification Mission - CESW Goals & Benefits

## Mission of NFPA Certification Programs

The overall mission of NFPA certification programs is to enhance human and organizational performance as related to the use and application of NFPA codes and standards.

## Who is this program for?

The NFPA Certified Electrical Safety Worker (CESW) program is designed to meet the needs of electricians and other electrical professionals who perform hands-on electrical work and are therefore exposed to significant electrical hazards, as it proves knowledge and competence in NFPA 70E.

## Goals of the CESW certification program are to:

- Showcase an individual's knowledge and proficiency with the practices and concepts found in NFPA 70E, *Standard for Electrical Safety in the Workplace*.
- Promote electrical safety awareness in workplace environments through the use of published NFPA standards
- Enhance professional development by ensuring a uniform, fair process for certification that is accessible to everyone who is eligible
- Promote professional development through continuous learning

## Benefits of the CESW certification include:

- Certification by NFPA, the foremost authority for NEC and electrical safety codes and standards
- Printable CESW certificate suitable for framing

## Important Note Regarding Designation as a Qualified Person:

Per NFPA 70E Section 110.2(A)(1), designation as a Qualified Person involves factors such as training on equipment and work methods that can be specific to a work site, job function, or employer. Therefore, earning the CESW credential alone does not make the certificant a Qualified Person. It is the responsibility of an employer or governmental agency having jurisdiction to outline the specific requirements necessary to become a Qualified Person for any given job or site. Employers and others may include this certification as one part of the requirements to become a Qualified Person.

# Obtaining the CESW Certification

## Entry Requirements

This section describes the eligibility requirements for entry into the CESW certification program. Because the CESW certification is designed to be obtained by electricians and other hands-on electrical workers, the entry requirements are centered on training and experience in that field.

A candidate for the CESW certification must meet all of the following three minimum requirements before being eligible to register for the CESW exam:

1. Must have a high school diploma or equivalent

—AND—

2. Must have completed a minimum of 40 hours of electrical safety training (online or classroom) from one or more of the following sources within the last 3 years (36 months prior to application):
  - NFPA 70E or other related Electrical Safety Training from professional organizations such as NFPA, IBEW, NECA, IEC, etc.
  - Other approved electrical safety training (contact the NFPA Admin & Support Services if you have questions as to whether a course counts or if you wish to register another electrical safety program at [adminsvcs@nfpa.org](mailto:adminsvcs@nfpa.org))

**NOTE:** Training on NFPA 70, National Electrical Code is not considered electrical safety training for this requirement but is recognized as an important foundation. Therefore, such training counts on a ½ basis (i.e. 10 hours of NEC training counts as 5 hours toward this 40 hour requirement) and can only be counted toward a maximum of 5 of the required 40 hours.

—AND—

3. Must be an electrician, electrical testing technician, or other electrical worker who has met **one** of the following three requirements:
  - a) Completed an apprenticeship program that provides both a minimum of 576 hours of related instruction and 8,000 hours (4 years) of verifiable work experience with electrical power systems (training and work hours will be verified using transcripts or certificates of completion).

--OR—

- b) Completed a minimum of 250 hours of related instruction (verified using transcripts or certificates of completion) and a minimum of 12,000 hours (6 years) of verifiable work experience with electrical power systems

--OR--

- c) Be a certified (NETA or equivalent) Level III or IV Electrical Testing Technician in good standing.

Note: Regarding Acceptable Documentation – Self-employed personnel with no direct supervisor should contact the NFPA certification department by emailing us at [adminsvcs@nfpa.org](mailto:adminsvcs@nfpa.org). The certification administrators will work with you to gather the proper acceptable documentation.

Note: Please feel free to contact NFPA with any questions regarding your entry into this certification program by emailing us at [adminsvcs@nfpa.org](mailto:adminsvcs@nfpa.org).

### **Non-Discrimination Policy**

NFPA evaluates all CESW candidates without regard to race, color, religion, sex, sexual orientation, national origin, ancestry, age, or disability.

### **Program Fees & Payments**

The CESW program fees are as follows:

- \$350 USD on initial program application (includes initial examination fee)
- \$175 USD retest examination fee (each time the exam is retested)
- \$150 USD to recertify at the end of your three (3) year certification period

Note: Other fees may be assessed and you may forfeit your examination fee if you do not appear for an exam or if you reschedule your testing date (see the **Rescheduling Exams** paragraph later in this section).

All payments must be received before any exam is taken or, in the case of recertification, before your three (3) year certification period ends. The NFPA accepts credit cards and checks. Please ensure all checks are payable to NFPA and are sent to the mailing address listed here:

NFPA Admin & Support Services  
11 Tracy Drive  
Avon, MA. 02322

## **Application Acceptance**

An application is accepted only when both of the following requirements are met:

- All required application information is provided to NFPA, including...
  - a completed and signed program application submitted online or via mail.
  - all acceptable documentation for your entry requirements
- The examination fee is processed by NFPA

Following the receipt of your CESW application form and examination fee, the NFPA will send you an authorization email with instructions on how to schedule the computer-based exam. A list of test centers is located at the test administrator's website at

<https://proscheduler.prometric.com/scheduling/searchAvailability>

## **Program Duration**

You have twelve (12) months after you are accepted as a CESW applicant to take and pass the exam. The twelve (12) month timer starts on the day your CESW program application is accepted by the NFPA Admin & Support Services. If you do not pass the exam before the twelve (12) month period expires, you will be required to submit a new application and payment of \$350 USD.

## **Recertification**

Once you become CESW certified, you must recertify every three (3) years. In order to maintain currency and relevancy with electrical safety in the workplace, CESW certification holders are required to demonstrate their continuing participation in professional development activities. This is accomplished through a points system. The detail of the process and the various means by which to earn recertification points can be found under Recertification Requirements section below.

The fee for recertification is \$150 USD.

## **Exam Attributes**

The exam is a three (3) hour maximum, open-book, 110 multiple choice question, computer-based, proctored exam taken at an approved testing center. Of the 100 exam questions, 100 are scored and 10 are being evaluated for future use as scored items. Examinees will not know which items are scored or un-scored.

## **Exam Results**

The computer-based examination allows candidates to receive their results immediately upon completion. The exam results are reported as pass or fail. Your actual exam score or percentage will not be provided. You will also receive a diagnostic report that provides an infographic indicating how you performed on each content area so that you may see which topics you will need to study to prepare for a retest.



We do not reveal the number of correct questions that must be answered (known as a cut score). Your actual number (%) exam score will never be reported to you for either a passing score or a failed score.

See the **CESW Exam Weighted Criteria Table** in the **Appendix** section of this handbook for a listing of the CESW exam domains.

## Retesting

If you fail your initial exam, you are permitted to retest two (2) additional times (*completing a retest application and paying a retest fee each time*) within twelve (12) months from the day your original CESW application was accepted. If you fail the examination three (3) times within this period, you must wait until the twelve (12) month testing period expires before you will be allowed to restart the registration process. The cost to retest is \$150 USD.

For candidates who entered the program after 5/18/22, the retest application form is found on the CMS at <http://onlinecertification.nfpa.org/nfpassa>

For candidates who entered the program prior to 5/18/22, a downloadable PDF is available at [www.nfpa.org/cesw](http://www.nfpa.org/cesw).

**IMPORTANT:** For candidates emailing the PDF retest application, you **MUST** use the [NFPA secure email](#) server. Once you access this server and create your NFPA secure email account, you should select OTHER from the "To" pull-down list, and then enter [adminsvcs@nfpa.org](mailto:adminsvcs@nfpa.org) in the address box. Complete the email process by attaching your personal documentation and clicking "Send."

## Rescheduling and Cancellation Policy

If you wish to change your exam date or time, you may do so through the Prometric scheduling portal at <https://proscheduler.prometric.com/?prg=NFPA2&path=confirm> or by contacting Prometric's contact centers listed on <https://www.prometric.com/nfpacert>.

There is no charge for reschedule or cancellation of an appointment if the change is made 30 or more days prior to your appointment date.

Between 29 and 5 calendar days prior to your appointment date, you may cancel or reschedule your appointment, but you will be required to pay a \$50 fee (to Prometric).

4 or fewer days prior to your appointment date, you may not reschedule. If you cancel your appointment during this period or fail to appear for your appointment, you will be considered a no-show, and will need to submit a retest application with NFPA and pay applicable fees prior to scheduling a new appointment.

## Examination Preparation & Reference Materials

Here is a listing of recommended exam preparatory learning and reference materials:

- For candidates new to electrical safety topics, The NFPA recommends completion of the NFPA **Overview of NFPA 70E** seminar (or equivalent training).
- The NFPA recommends familiarity with the **NFPA 70E Handbook for Electrical Safety in the Workplace**® 2021 Edition (Note: This book is for optional exam preparation use only and therefore is **NOT** allowed in the testing center during the actual exam).
- Through self-study and other learning methods (see the section entitled **Entry Requirements** earlier in this handbook for details on preparatory training hour requirements), candidates must become thoroughly familiar with the **NFPA 70E Standard for Electrical Safety in the Workplace**® 2021 Edition **Note:** This (NFPA original printed book) is the **only** reference allowed in the testing center for your use as “open book” material during the actual exam.

Note: Both the **NFPA 70E Handbook for Electrical Safety in the Workplace**® 2021 Edition and the **NFPA 70E Standard for Electrical Safety in the Workplace**® 2021 Edition books are available for purchase at [www.nfpa.org/catalog](http://www.nfpa.org/catalog) (in the NFPA 70E® section), or by phone at 1-800-344-3555.

## Taking the Examination

The following suggestions, regulations, and procedures pertain to every applicant taking the examination:

- You must present a valid photo ID at the test center. The name on your ID must match the name you used for exam registration and scheduling. If they do not match, you may be turned away at the test center.
- Phone, pagers, smart watches, and any other personal electronic device are strictly prohibited in the test center. You will be provided a secure locker to store them in while you take the exam.
- Personal calculators are NOT permitted at the test center. A scientific calculator is available on-screen.
- You should bring only the approved, published and copyrighted NFPA references identified in this handbook into the exam room. Photocopies of the standards, additional pages with notations, and other test taking aids are not permitted. All materials taken into the exam room are subject to review by the test center proctor.
- You may highlight, tab, and make notations within your NFPA documents prior to entering the exam room. Only commercial permanent adhesive type tabs are allowed. Post-it type notes and flags or other types of easily moveable tabs are not permitted. You may not write on, mark in, or tab the pages of your NFPA documents during the examination. Doing so will be grounds for dismissal from the test site.
- Electronic versions of the reference materials are not permitted to be used at the test site.
- Visitors are not permitted at the test center.
- If you wish to leave the room during the test, you must secure the proctor's permission. You will not be allowed to make up lost time.
- Smoking is not permitted in the testing area.
- The NFPA shall have the right to revoke or invalidate any examination score with or without a finding of fault or misconduct if data forensic analysis or other credible evidence establishes a reasonable possibility that a score is not valid or the integrity or security of the exam was compromised.
- Examination Security: Failure to follow candidate instructions regarding examination security will result in your application being voided and forfeiture of your examination fee. Conduct that results in violation of examination security or disrupts the administration of the examination could result in cancellation of your examination and dismissal from the testing center. In addition, your examination will be considered void and will not be scored. Examples of misconduct include, but are not limited to, the following: writing in your NFPA 70E Standard book, looking at another candidate's examination, or talking with other candidates anytime during the entire examination period. You are particularly cautioned not to do so after you have completed the examination, as other candidates in the area might be taking a break and still not have completed the examination. You may not attend the examination only to review or audit test materials. You may not copy any portion of the examination for any reason. No examination information may

leave the test room under any circumstances. This includes memorizing questions for distribution to any other person. No unauthorized persons will be admitted into the testing area. It is very important for you to note all examination content is strictly confidential. You may only communicate about the test, or questions on the test, using the appropriate forms provided within the examination delivery system. At no other time, before, during or after the examination, may you communicate orally, electronically or in writing with any person or entity about the content of the examination or individual examination questions.

## **Completing the Certification Process**

Once scoring of your exam is complete and other certification program requirements are met, you will receive the following items from NFPA:

- CESW certificate suitable for framing

For individuals who entered the program after 5/18/22, your certificate is available in the CMS at <http://onlinecertification.nfpa.org/nfpassa>.

For individuals who entered the program prior to 5/18/22, your certificate will be emailed to the address you provided.

# Recertification Requirements

## Recertification Process and Timing

Once you attain your CESW certification, you must recertify every three (3) years (36 months from the date on your certification documentation). Failure to meet all recertification requirements in a timely manner will result in you being removed from the NFPA certification list and will require you to register and retake the examination as a new CESW candidate.

NFPA will attempt to send you an email with an enclosed recertification form approximately three (3) months before your certification expiration date.

The recertification application form may be found on the CESW certification web page located at [www.nfpa.org/CESW](http://www.nfpa.org/CESW).

**IMPORTANT:** When emailing the recertification application to NFPA, you must use the [NFPA secure email](#) server. Once you access this server and create your NFPA secure email account, you should select OTHER from the "To" pull-down list, and then enter [admins@nfpa.org](mailto:admins@nfpa.org) in the address box. Complete the email process by attaching your completed form and clicking "Send."

## Recertification Fee

The fee for recertification is \$150 USD

## Recertification Points System

Recertification of your CESW is accomplished by accumulating a required amount of recertification points, as shown in Table 5, before your three (3) year certification period ends. It is important that you begin accumulating the required points as soon as possible. If college courses are declared for training hours, the same course cannot be taken twice within the 3-year period, and the candidate must convert credit hours to actual hours spent in the classroom.

A copy of the recertification submittal form and the points form are found on the CESW certification pages located at [www.nfpa.org/CESW](http://www.nfpa.org/CESW) or in Appendix I of this handbook. It is highly recommended that you track your progress using these forms as you accumulate points over the three (3) years of your certification and before your certification expiration date.

**Table 5: Recertification Requirements Point System**

<b>CESW Recertification Requirements</b>					
In order to maintain currency and relevancy in the CESW field of practice, certification holders are required to submit a minimum of fifty (50) points of documented professional development for recertification. The 50 points must be submitted during the 3-year recertification cycle and must be related to the electrical safety profession.					
<b>Training and Professional Education</b>	<b>Allotted Points</b>		<b>Minimum Points</b>	<b>Maximum Points</b>	<b>Required Documentation</b>
Electrical Safety Training: Classroom or online training in electrical safety*	1 point	per contact hour	20	50	Certificate or letter of completion from presenter
NFPA 70: National Electrical Code (NEC) training	0.5 point	per contact hour	0	16	Certificate or letter of completion from presenter
<b>Other Professional Development</b>	<b>Allotted Points</b>		<b>Minimum Points</b>	<b>Maximum Points</b>	<b>Required Documentation</b>
Attendance at an electrical safety conference (such as the NFPA Conference & Exposition or others)	10 points	per conference	0	10	Proof of registration
Instructing or lecturing by the certification holder	2 pts	per hour of delivered training	0	40	Letter from supervisor or organizational training record
Membership on the NFPA 70E Technical Committee	10 pts	Per recertification period (3 years)	0	10	Official listing as technical committee member.

**Note: NFPA reserves the right to alter any recertification requirements as deemed necessary**

\* Training for this section can be on NFPA 70E, NFPA 70B, NESC, OSHA electrical safety training, arc flash, or any other course that is genuinely about electrical safety (such as electrical thermography), subject to approval by the NFPA Admin & Support Services.

CEU/Point Conversion: 1 CEU = 10 contact hours = 10 points

## Recertification Audit

Certification holders will be subject to a random audit of their CESW recertification documentation for a period of up to six months after their recertification date. Accordingly, certification holders are expected to retain recertification documentation in their possession for six months beyond their recertification date. Recertification Points Forms are available at [www.nfpa.org/CESW](http://www.nfpa.org/CESW). Back up documentation is not required when submitting the Summary of Recertification Points Form.

## Documentation

Reasonable proof of attendance/participation in the described categories will be accepted. Reasonable proof includes copies of agendas, rosters, or other descriptive program materials which have been signed and dated by the presenter/sponsor indicating the certification holder's attendance, course certificates, letters of attestation from course sponsors, college transcripts, and letters from employers. The certification holder is required to sign the descriptive materials as an attestation of their attendance.

**Note:** While NFPA will attempt to contact you before your recertification period expires, you are ultimately responsible to maintain your recertification points and send NFPA the recertification application and fee before your recertification period expires. Informing NFPA Certifications Department of any changes to your contact info will help greatly in ensuring we can reach you with reminders.

For more information please contact:

Mail: NFPA Admin & Support Services  
11 Tracy Drive  
Avon, MA. 02322

Email: [adminsvcs@nfpa.org](mailto:adminsvcs@nfpa.org)  
Web: [www.nfpa.org/certification](http://www.nfpa.org/certification)

## CESW Exam Content Blueprint and Weighted Criteria Table

The following table indicates the approximate percentage (%) of exam content (exam items) for the four (4) major domain areas and the sub-components of those domain areas:

- |   |            |
|---|------------|
| <b>I. Understand Electrical Safety-Related Work Practices</b>   | <b>20%</b> |
| A. Identify and define terminology related to electrical safety   |            |
| B. Define requirements to be qualified to work on electrical equipment and systems  |            |
| C. Recognize potential electrical hazards   |            |
| i. Identify the hazards associated with energized electrical conductors and circuit parts                                   |            |
| a. Explain when a shock hazard exists   |            |
| b. Explain when an arc flash and arc blast hazard exists  |            |
| c. Identify how hazards change with respect to location in the system or equipment  |            |
| ii. Explain the relationship between electrical hazards and potential injuries  |            |
| a. Contact injuries (e.g., current flow through tissue, burn)   |            |
| b. Arc flash and arc blast injuries (e.g., thermal burn, hearing damage, concussion)  |            |
| iii. Identify methods to control the risk associated with electrical hazards  |            |
| a. Hazard elimination (i.e., create an electrically-safe work condition)  |            |
| b. Substitution (e.g., use of non-electrical equipment, battery-operated hand tools)  |            |
| c. Engineering control (e.g., GFCIs, barriers)  |            |
| d. Awareness controls (e.g., signs, labels, barricades)   |            |
| e. Administrative controls (e.g., training, job planning, procedures)   |            |
| f. Personal protective equipment (e.g., insulated tools, arc-rated apparel, voltage-rated gloves)                           |            |
| D. Determine the nominal voltage of exposed energized electrical conductors and circuit parts                               |            |
| E. Distinguish exposed energized electrical conductors and circuit parts from other parts of electrical equipment           |            |
| F. Identify emergency procedures for assisting victims of electrical incidents  |            |
| i. Identify methods of release from contact   |            |
| ii. Identify emergency response requirements  |            |
| G. Identify requirements for a job briefing   |            |
| H. Understand worker responsibility to implement employer's electrical safety program                                       |            |
| <b>II. Establish an Electrically-Safe Work Condition</b>  | <b>20%</b> |
| A. Identify requirements for de-energization according to employer program  |            |
| B. Explain how to identify all possible sources of electric supply  |            |
| i. Interpret a single-line diagram  |            |
| ii. Identify the power sources and disconnecting means  |            |
| C. Understand how to properly interrupt the load current(s) and open the disconnecting device(s) for all electrical sources |            |
| i. Differentiate between load-break and a non-load-break switch and/or disconnect   |            |
| ii. Visually verify isolation where possible  |            |
| D. Identify and apply lockout/tagout (LOTO) devices in accordance with a documented and established policy                  |            |
| E. Identify the steps to verify the absence of voltage  |            |
| F. Identify temporary protective grounding equipment requirements (include 120.3)   |            |
| G. Identify the components and elements of the LOTO program and procedures  |            |
| i. Training   |            |
| ii. Procedures  |            |
| iii. Forms of control   |            |



- a. Simple
- b. Complex
- iv. Coordination
- v. Equipment
- vi. Elements of control

**III. Identify Precautionary Techniques for Work Involving Electrical Hazards**

**20%**

- A. Identify justification for not establishing an electrically-safe work condition
  - i. Greater hazard to de-energize
  - ii. Infeasibility
  - iii. Less than 50 volts (consider capacity)
- B. Determine energized electrical work permit requirements
  - i. Identify the permit elements
  - ii. Identify exemptions to the permit
- C. Define the requirements for reenergizing circuits after operation of overcurrent protective devices (OCPD)
- D. Understand the use of test instruments
  - i. Understand rating requirements
  - ii. Verify the operation of the test instruments and accessories
  - iii. Select test instruments and equipment appropriate for the environment
  - iv. Perform visual and mechanical inspection of the test instruments and equipment
- E. Understand the use of other equipment
  - i. Understand the appropriate use of portable electric equipment
  - ii. Perform field tests of GFCI protection devices in accordance with the manufacturer's recommendations
  - iii. Perform visual and mechanical inspections of portable electric equipment and cord sets
- F. Identify alerting techniques
  - i. Signs and tags
  - ii. Barricades
  - iii. Attendants
  - iv. Look-alike equipment

**IV Perform an electrical hazard risk assessment**

**40%**

- A. Identify the components of a shock risk assessment
  - i. Explain how to identify the voltage of electrical conductors and circuit parts
  - ii. Explain how to identify the approach boundaries for shock protection
  - iii. Describe the limited approach boundary and its use
  - iv. Describe the restricted approach boundary and its use
  - v. Describe the prohibited approach boundary and its use
- B. Identify the components of an arc flash risk assessment
  - i. Describe incident energy
  - ii. Identify the effect of clearing time, short circuit current, and worker distance on incident energy
  - iii. Interpret hazard information conveyed on equipment labels
  - iv. Describe the arc flash boundary
  - v. Explain how to apply the arc flash boundary
  - vi. Interpret hazard/risk category classifications
    - a. Understand that the tables incorporate risk
    - b. Understand that the tables are task/equipment based
    - c. Identify table limiting parameters
- C. Determine PPE requirements for electrical hazards
  - i. Types
    - a. Head, face, neck, and chin protection

- b. Eye protection
  - c. Hearing protection
  - d. Body protection
    - 1. Arc-rated garments
    - 2. Layering
    - 3. Underlayers
  - e. Hand and arm protection
  - f. Foot and leg protection
  - ii. Identify the requirements for the care and maintenance of PPE
    - a. Testing
    - b. Inspection
    - c. Care, maintenance, and storage
  - iii. Prohibited materials
  - iv. Ratings
    - a. Voltage
    - b. Arc
  - v. Limitations
  - vi. Use Table H.3(a) and H.3(b) in Annex H to select appropriate PPE when an incident energy analysis is performed and PPE requirements are not provided
  - vii. Identify PPE requirements when using the hazard/risk category classification method
- D. Select other protective equipment (e.g., insulated tools, ladders, shields)
- E. Anticipate equipment failure