Essential Arc-Flash and Power System Safety Training Course



14 - 18 Dec 2026

Cape town

4600 € (Per Person)

Ref: #ERE3665_265320

Course Introduction / Overview:

In the ever-evolving landscape of modern power systems, the risks associated with electrical hazards, particularly arc flashes, are a paramount concern for professionals across various industries. This comprehensive course, offered by BIG BEN Training Center, is meticulously designed to provide a deep understanding of arc-flash phenomena and the practical application of advanced safety and protection strategies. It goes beyond mere theoretical concepts, focusing on real-world scenarios and hands-on techniques that are critical for safeguarding personnel and equipment. Drawing on the foundational principles outlined in authoritative texts like "Arc Flash Hazards and Electrical Safety" by Ralph H. Lee and the globally recognized IEEE 1584 standard, this program equips participants with the knowledge to conduct thorough risk assessments, implement robust protective measures, and comply with the latest regulatory standards such as NFPA 70E. BIG BEN Training Center is committed to delivering a forward-thinking curriculum that addresses the complexities of modern electrical systems, from incident energy calculations and protective device coordination to selecting and using the correct personal protective equipment (PPE). The course emphasizes proactive hazard mitigation and the establishment of a strong electrical safety program, ensuring that participants are not only aware of the dangers but are also fully capable of preventing them.

Target Audience / This training course is suitable for:

- Electrical engineers, designers, and consultants.
- Safety managers, coordinators, and supervisors.
- Maintenance and operations personnel.
- Electricians, technicians, and contractors.
- Facility managers and plant operators.
- Risk assessment professionals.

Target Sectors and Industries:

- Power generation, transmission, and distribution.
- Oil and gas.
- Manufacturing and heavy industry.
- Construction and engineering firms.
- Government agencies and public works departments.
- Data centers and information technology infrastructure.
- Utilities.

Target Organizations Departments:

- Engineering.
- Health, safety, and environment (HSE).
- Operations and maintenance.
- Compliance and risk management.
- Facility management.
- Quality assurance.

Course Offerings:

By the end of this course, the participants will have able to:

- Assess and mitigate arc-flash hazards effectively.
- Understand and apply the principles of protective device coordination.
- Select and use appropriate personal protective equipment (PPE) for arc-flash safety.
- Perform incident energy and arc-flash boundary calculations.
- Develop and implement a comprehensive electrical safety program in accordance with NFPA 70E.
- Identify common causes of arc-flash incidents and implement preventive controls.
- Analyze and interpret arc-flash warning labels and safety documentation.
- Implement lockout/tagout procedures to ensure a safe work environment.
- Apply risk management strategies to minimize electrical hazards.
- Coordinate power systems to reduce arc-flash energy.

Course Methodology:

This training course employs a dynamic, multi-faceted methodology designed to ensure maximum retention and practical application of the material. It moves beyond traditional lectures, incorporating a blend of interactive discussions, real-world case studies, and hands-on exercises that directly relate to the challenges of arc-flash safety and power systems protection. Participants will utilize modern industry standards and tools to simulate arc-flash scenarios, perform incident energy calculations, and select appropriate protective equipment. Group activities and collaborative problem-solving will be central to the learning experience, encouraging the exchange of ideas and best practices among peers. The course also includes detailed reviews of safety regulations and compliance requirements, ensuring that participants are not only technically proficient but also legally and professionally prepared. This comprehensive approach ensures that every participant leaves BIG BEN Training Center with a deep understanding of how to protect against arc-flash incidents and with the skills needed to create a safer work environment. The curriculum emphasizes the coordination of protective relays and the importance of accurate data collection for effective hazard analysis, all within a practical and engaging framework.

Course Agenda (Course Units):

Unit One: Fundamentals of Arc-Flash and Electrical Safety

- Understanding the arc-flash phenomenon and its associated hazards.
- Key electrical safety concepts and the importance of a safety program.
- Introduction to relevant standards and regulations, including NFPA 70E and IEEE 1584.
- Analyzing the causes and severity factors of arc-flash incidents.
- Establishing an electrically safe work condition.
- Principles of lockout/tagout (LOTO) procedures.
- Risk assessment and hazard analysis methodologies.

Unit Two: Incident Energy and Arc-Flash Boundary Calculations

- Introduction to incident energy and arc-flash boundaries.
- Step-by-step guidance on data collection for arc-flash studies.
- Performing calculations using the IEEE 1584 standard.
- Understanding the variables that impact incident energy.
- Practical exercises in calculating incident energy for various power systems.
- Interpreting and applying calculation results.
- Use software tools for arc-flash analysis.

Unit Three: Protective Device Coordination for Arc-Flash Mitigation

- Fundamentals of protective relaying and overcurrent protection.
- The role of circuit breakers, fuses, and relays in arc-flash protection.
- Understanding time-current curves (TCCs).
- Coordination studies to reduce arc-flash incident energy.
- Advanced strategies for arc-flash mitigation, such as fast-acting relays.
- Case studies on real-world coordination problems.
- Optimizing system protection to enhance safety.

Unit Four: Arc-Rated Personal Protective Equipment (PPE) and Labeling

- Selecting and understanding arc-rated clothing and equipment.
- Differentiating between arc-rated, flame-resistant, and flame-retardant materials.
- Proper use, care, and maintenance of PPE.
- Requirements for arc-flash warning labels.
- Creating and interpreting arc-flash hazard labels.
- The importance of a documented PPE program.
- Compliance with regulatory requirements for PPE.

Unit Five: Implementing an Arc-Flash Safety Program and Best Practices

- Developing a comprehensive electrical safety program.
- Roles and responsibilities of qualified and unqualified people.
- Conducting job hazard analysis (JHA) and safety briefings.
- Emergency response planning for electrical incidents.
- Safe work practices for energized and de-energized conditions.
- Maintaining compliance through regular audits and documentation.
- Exploring future trends and technologies in arc-flash safety.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

In an era of increasingly complex power grids, how does the adoption of new technologies like smart grids and renewable energy sources impact the traditional methods for arc-flash hazard assessment and mitigation?

What unique qualities does this course offer compared to other courses?

This course stands out by bridging the gap between theoretical knowledge and practical application, providing a holistic and integrated understanding of arc-flash safety. While many programs focus solely on NFPA 70E compliance or basic awareness, our curriculum delves into the technical intricacies of power system protection and coordination. We provide in-depth instruction on how to perform and interpret complex calculations, a skill set that is essential for true hazard mitigation. The course also uniquely incorporates real-world case studies from diverse industries, offering tangible examples and actionable insights. By exploring the relationship between protective devices and incident energy, participants gain a mastery of not just what to do, but why it's so important. This program also gives participants the confidence to develop and manage a robust electrical safety program within their organization, moving beyond simple compliance to creating a culture of proactive safety. It’s an academic, yet intensely practical, training experience that is unmatched in its field.