Arc Flash Electrical Safety & Advance Power System Protection

A focused program on Safe Systems of Work and Arc Flash prevention, giving electrical teams the tools to protect people and power networks.

DATES
15th - 17th July 2026

VENUE
Johannesburg - South Africa

Mr. David Davenport

Chief Consultant Engineer - ESIPAC
Techical Director - Transmag UK

COURSE TRAINER

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Arc Flash Electrical Safety & Advance Power System Protection

15th - 17th July 2026 - Johannesburg - South Africa

Course Overview

This **3 day training** program is designed for **technicians and engineers** to build a solid understanding of safe systems of work, awareness and prevention of arc flash events and **typical electrical basic** and **advanced electrical safe** working. The course follows international **IEC and IEEE standards**, combining theoretical fundamentals with practical applications and hands-on examples. Participants will start with an overview of responsibilities and duties, the dangers of arc flash, on to understanding and implementing **the Hierarchy of Controls**, recognised by **OSHA, NFA 70E; IEE; NEBOSH** as the basic fundamentals in **Safe Systems of Work, (SSoW).** We progress on to addressing the hidden dangers of **partial discharge**, **poor housekeeping**, **humidity** and **thermal heat increases** and progressively move to, process, **documentation**, **LOTO**, additional options, solutions methods of prevention, solution options and finally the last line of defence, **PPE**. All subjects with time allocated for interactive Q&A and discussions.

Key Learning Outcomes

Who is responsible for Electrical safety and resilience on operational sites:

- Investigate roles, who is responsible, why we need to identify and how to carry those duties out for the benefit of the organisation, **the safety of your engineers and the resilience of your site**.

Arc Flash, how they are created, how to prevent, options to consider:

- An insight and awareness to how an **arc flash** can occur, causes implications, simple actions to prevent. **Monitoring and timeline Partial Discharge and Thermal heating** for full life asset extension

Understanding the availability and options for safe working Systems (SSoW):

- Gain an **in-depth grasp of both HV and LV electrical safe systems** of work, including fault levels and energy working levels studies following **NFA 70E; IEC and IEEE guidelines and standards**.

Insight into how to implement simple methods of traceable documentation:

- Learn the critical role of registering works, ensuring reliable **SLDs**, composing **Switching Method Statements enforcing LOTO** that is traceable and accountable, how to compose accurate and achievable **Risk Assessments** and **Permits to Work** and **the benefit of Dynamic Risk Assessments.**

Protecting your infrastructure from catastrophic failure and keeping engineers safe:

- The **5 crucial steps of the Hierarchy of Control (HoC).** Each step investigated for practicalities and overall benefits. What the **HoC** will achieve if carried out

Best Practice Procedures:

- Integrating **SSoW incorporating**; **Documentation**; Safe Entry to **Switchrooms and Substations**, working on or near exposed live equipment; working at height and/or confined spaces; **SLDs and Signage**; **Isolation and re-energising safely**; Safe Ingress and access

Lock of Tag off (LOTO):

- Safe methods of introducing with full **traceability, coordinating, register log and key safe terminals and responsibilities**

Arc Flash PPE:

- When to wear, when not to wear and how to wear, identifying correct ratings, why sometimes the last line of defence is your only line of defence. **Actual incident case reviews.**

Who will Benefit Most?

This course is ideally suited for **health and safety, duty officers**, **technicians and engineers** involved in the **installation, operation, maintenance, and commissioning** of **electrical power systems**. Whether you're directly responsible for electrical safety, complying with or working to, this gives an insight into **safe workers practices**. The skills and insights gained will **enhance your professional competency** and support **your organisation's commitment to electrical safety.**

Course Facilitator

David Davenport

Chief Consultant Engineer - ESIPAC
Techical Director - Transmag UK

This course will be delivered by an **experienced Electrical** Engineer with over **40 years of expertise** commencing as an electrical apprentice in the **Mining industry.**

Professional Memberships

- Board Member **ESIPAC.online**
- Associate Fellow of the **Higher Education Academy (FIoI)**
- Member of the **Institution of Engineering and Technology (MIET)**
- Member of the **Institution of Leadership and Management (MInstLM)**

Key Professional Highlights:
Professional Certificates and Qualifications

- **CEng I Electrical Engineering**
- CEng in **Electrical Safety Management**
- **HNC Electrical** Engineering
- **ONC Electrical** Engineering
- **NEBSS Man Management Diploma**
- **IOSH Safety Certificate**
- **Authorised Person LV**
- Senior Authorised Person – **Safe Switching Operation of High Voltage Power Systems**
- Authorised Engineer **(HV & LV)**
- Senior Authorised Person
- Wiring Regulations **17th Edition BS 7671**
- Temporary installations at concerts and sporting venues **BS 7909**
- Test and Inspection **BS2391**

Going on to continued and further studies throughout his career. A career of project management on **electrical infrastructure**, **electrical apparatus and safety procedures**. Leading significant projects across a diverse range of industries including **aerospace, mining, oil & gas**, **data centres, heavy industry, marine and micro grids**. With advanced academic **qualifications 2 degrees in electrical safety**, a member of **MIET and a Fellow of Leadership** and **Management Institution**. Presently serving as **Chief Electrical Engineer Board Member** for the **global safety standards committee ESIPAC**, **ESIPAC.online the trainer** has a long history of **electrical safety training**, **conferences and seminars**, including **Australia, New Zealand,** throughout **EU, UK and Ireland**. A highly credited career, **recently awarded** in The **House of Lords** for service to industry.

Project Experience
The trainer has successfully completed several **high profile projects**, including but not limited to:

- **Airbus 380 fuselage** interconnect design
- **Concorde re flight**
- **Audi/Toyota joint venture R&D GPS**
- **NEC internal antenna design project management**
- **Aston Martin production re-site**
- **Forth Ports Leith Docks,** UK
- **Tarmac Mountsorrel Site,** UK
- **Octopus Hydrogen Plant,** UK
- Makufa Site Transfer
- **Hull Biomass Power Plant, Arc Flash design and commission,** UK

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Day 1

Fundamentals of Arc Flash, Safe Systems of Work, Responsibilities and Best Practice Procedures

Session 1: Introduction to Safe Systems of Work (SSoW)
- Purpose of operating **SSoW**
- Enhancing **safety for electrical workers**
- Ensuring **resilience and reliability** in industrial power networks
- **Overview of arc flash:**
  - **How they form**
  - **Causes**
  - **Implications**
  - **Prevention strategies**

Session 2: Hierarchy of Controls (HoC)
- Universally accepted method for preventing **Arc Flash explosions**
- Key points, **advantages, and disadvantages** of each stage
- Assessment of most practical controls for specific exercises
- Best implementation order
- Small group exercise

Session 3: Best Practice Procedures
- Successful **integration of safety processes**
- Examination of **existing safety processes and improvements**
- Safe entry access **(Ingress and Egress)**
- **Precautions for working:**
  - On or near exposed live equipment
  - At heights
  - In confined spaces
- Importance of **Single Line Diagrams (SLDs)** on display

Session 4: Arc Flash Awareness, Prevention, Detection, Protection, Mitigation
- **Understanding arc flash:**
  - Common causes
  - Simple prevention rules
- **Arc Flash detection:**
  - Technologies for early **detection and protection**
  - Preventing **catastrophic failure and engineer** harm
- Mitigation measures for **high-financial or critical risks**

Day 2

Working through the Hierarchy of Control

Session 1: Working Dead and Step Two: Substitution
- Overview of considerations and selecting the most practical and **commonsense approach**
- **Working Dead**:
  - Definition and importance of **"proving dead"**
  - **Why confirming dead is essential**
  - When the ultimate safety step can and cannot be applied

Session 2: Substitution or Replacement:
  - Safety measures and options for enhanced personal and **apparatus protection**
  - **Evaluation and implementation** strategies
  - Workplace benefits and impact assessment
- **Safe Access Considerations:**
  - **PD (Partial Discharge) monitoring**
  - **Thermography**
  - **Humidity monitoring**
- **Scenario Analysis:**
  - Impact of not implementing these steps

Session 3: Engineering
- Examination of engineering support systems in **Safe Systems of Work (SSoW)**
- **LOTO (Lock Out; Tag Out):**
  - **Correct implementation**
  - **Eliminating errors and confusion**
- Castell Arrangements
- **Software Platforms** for SSoW:
  - Remote racking: benefits and cautions
- **Signage & SLD Engagement**
- Toolbox Talks: Importance and best practices

Session 4: Process and Documentation
- **Focus Areas:**
  - **Responsibility, accountability, and traceability**
  - **Duty Holders and SAP** (Senior Authorized Persons)
- **Key Documents & Processes:**
  - **Risk Assessments (Dynamic Risk Assessments)**
  - Method **Statements & Switching** Method Statements
  - Permits to Work
  - Special considerations for:
    - **Working at heights**
    - **Combustible environments**
    - **Confined spaces**
- **Best Practices:**
  - **Authoring, managing, distributing, and recording** documentation

Session 5: PPE – Last Line of Defense
- **Arc Flash PPE (AF PPE):**
  - Correct category or class assessment
  - When to wear and when not to wear
- **Key Considerations:**
  - **Layering**
  - **Undergarments**
  - **Safety footwear**
- **Case Studies:**
  - **Real-life scenarios and comparisons of various PPE** types and styles

Key Takeaways & Preparation for Next Day
- Review of **discussions, debates, and exercises**
- Action points for preparation for next day's classroom practical exercises

Day 3

Practical Applications, a SSoW process

Session 1: Putting into Practice: Procedures We Have Investigated
- **Hands-on session:**
  - Students work on a pre-prepared classroom exercise for a switching program
  - Small group collaboration to set strategy and planning for planned works
  - Identifying key documentation needed for **Safe Systems of Work (SSoW)**

Session 2: Drawing Up the Documentation for SSoW Process
- **Classroom exercise:**
  - Small groups complete the morning's task and walk through each procedure
  - Coordination of **documentation, proofreading, and traceability**
  - Evaluating which methods enhance **safety reinforcement**

Session 3: Reflection & Application of Hierarchy of Controls (HoC)
- Reviewing the previous days' work
- Pairing up to reflect and develop personalized processes
- Applying theoretical and practical knowledge to individual workplace scenarios
- **Ensuring safety, colleague protection, and infrastructure resilience**

Session 4: Putting into Practice – Final Q&A and Discussion
- **Open discussion** to reinforce learning
- Revisiting any topic from the three days:
  - **Fundamentals from Day 1**
  - **HoC, SSoW, or Toolbox Talk from Day 2**
  - **Practical applications from Day 3**
- Instructor-led summary of key takeaways and best practices
- Understanding how each component contributes to electrical safety and system resilience

Session 5: Final Reflections
- Open floor for participants to:
  - Cross-examine results
  - Ask final questions
  - Share opinions on the training's value and impact
- Discussion on how the training will influence future electrical safety practices
- **Opportunity to share real-world challenges and feedback in a collaborative wrap-up**

Programme Schedule

08:30 am – 09:00 am	Registration & Coffee Break
09:00 am – 11:00 am	Course
11:00 am – 11:30 am	Networking & Coffee Break
11:30 am – 01:00 pm	Course
01:00 pm – 02:00 pm	Networking & Luncheon
02:00 pm – 03:00 pm	Course
03:00 pm – 03:15 pm	Networking Break
03:15 pm – 05:00 pm	Course

Who Should Attend?

- **Health and Safety Management:** Experience of implementing and managing the safety requirements on an industrial site
- **Electrical Engineering Knowledge:** Familiarity with fundamental electrical concepts (AC/DC circuits, basic understanding of switchgear arrangements, and power system operation)
- **Understanding of Power Systems:** A general understanding of industrial power distribution, including high voltage and low voltage systems
- **Experience with Electrical Equipment:** Practical exposure to electrical equipment from industrial work environments to support understanding of protection systems
- **Basic Familiarity with one or more of operating:** installing, commissioning, testing, fault finding, servicing, designing, and general Health & Safety practices; prior experience with or understanding of protective relays and related components is beneficial, though not mandatory

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Registration Form

Please fill & sign below form & send us on
training@Indulead.com

Event Code: IL-AFES-025

Delegate 1
Name : _____
Job title: _____
Email: _____
Mobile:_____

Delegate 2
Name : _____
Job title: _____
Email: _____
Mobile:_____

Delegate 3
Name : _____
Job title: _____
Email: _____
Mobile:_____

Delegate 4
Name : _____
Job title: _____
Email: _____
Mobile:_____

Delegate 5
Name : _____
Job title: _____
Email: _____
Mobile:_____

Note: In case of 6 or more nominations make a duplicate of this form & fill in the details.

ORGANIZATION DETAILS:

Company :_____
Address: (to be used on invoice):
_____
_____
Telephone:_____
Country: _____

AUTHORIZED BY:

Signature:_____
Name: _____
JobTitle:_____
Email:_____
Date:_____

PAYMENT DETAILS:

Credit Card Holder's Details - To send Payment Link
First Name: _____
Last Name: _____
Email: _____
Country: _____

Course Fee

Registration Fees:

• Book 1 delegate	Pay USD 1,595/delegate
• Book 2 or 4 delegates	Pay USD 1,295/delegate
• Book 5 or more	Pay USD 995/delegate

(All pricing excludes all taxes)

Payment Mode:

- Payments will be made by **Credit Card** or by **Bank transfer**, an Invoice will be sent soon after we receive the signed & filled registration form.
- Payment is required within **5 working days** after the receipt of the invoice.
- Payment must be received in full prior to the Course Origination.

Terms & Conditions:

1) Fee Includes (For Face 2 Face Training): the course fee covers all course material, lunch & refreshments. Please note that hotel accommodation is not included in the course fee.
2) Fee Includes (For Virtual Training): the course fee covers the live course session & the course material soft copies along with Certificates of Attendance.
3) Payment terms: Payments are required within 5 working days from the date of receipt of an invoice; all payments should be transferred by Credit Card/bank transfer to the Indulead International account. A receipt will be issued as payment is received.
4) Cancellation /Substitution Policy: Cancellation is only acceptable if submitted to us by email & will be subject to charges, cancellation received 60 days prior to the event 25% of the training fee will be charged, 30 Days prior to the event 50% of the training fee will be charged. 15 days prior to the event 75% of the training fee will be charged, 7 days prior to the event 100 % of the training fee will be charged. Substitution is the best option to avoid cancellation, as the cancellation is required in writing via email likewise Substitution is also required by email with complete details of the substituted delegates (Name, Position, Email & Mobile).
5) In the case of No Show, clients cannot claim any refund, & are not entitled to claim the Credit Voucher.
6) Cancellation by a paid client; does not subject to any cancellation charges, Indulead International will either accept the substitution or will provide a Credit Voucher of the Invoice amount which can be utilized in any of our future training, with validity up to 6 months.
7) Every possible effort is made to incorporate the event as it campaigns, however, due to any unforeseen circumstances Indulead International reserves the right to change the venue, location, and trainer. Also due to unforeseen circumstances, the event may be canceled or postponed, in this case, the paid delegate(s) Indulead International will process & refund the full amount, less the bank/service charges up to 5 % or less.
8) While all topics shown in this brochure will be covered in the course, the facilitator/instructor reserves the right to restructure and delivers them in a different order or sequence.
6) The client is considered aware of all the above terms and conditions, as they sign on this registration form & Indulead International will not be responsible for any expectation or monetary loss as indicated above.

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